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# THE

# AMERICAN JOURNAL

OF

# DENTAL SCIENCE:

374 H

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# TO READERS AND CORRESPONDENTS.

Communications intended for publication, and exchange journals and papers, should be addressed to the **Editors of the Journal**, Baltimore, Md. All letters relating to the **Business** of the Journal, or containing CASH REMITTANCES, to be directed to Messrs. **Lindsay & Blakiston**, Publishers, Philadelphia, Pa. Articles for publication should be received by the editors at least six weeks previous to the first day of the month on which the number in which it is designed for them to appear, is issued.

## *Medical and Dental Journals Received.*

1. *American Journal of Science and Arts.* Edited by Prof. B. Sillman, B. Silliman, Jr., James D. Dana, Asa Gray, and L. Agassiz. November. *In Exhange.*
2. *The Dental Register of the West.* Edited by J. Taft and Geo. Watt, D. D, S. December. *In Exchange.*
3. *The Dental Cosmos.* Edited by Drs. J. D. White, J. H. McQuillen and Geo. J. Zeigler. *In Exchange.*
4. *Boston Medical and Surgical Journal.* Edited by W. W. Morland and Francis Minot, M. D. Received regularly. *In Exchange.*
5. *The British and Foreign Medico-Chirurgical Review.* Received regularly. October. *In Exchange.*
6. *The American Journal of Medical Sciences.* Edited by Isaac Hays, M. D., Surgeon to Wills Hospital, &c. October. *In Exchange.*
7. *The Southern Medical and Surgical Journal.* Edited by Drs. Henry F. and Robert Campbell. October, November and December. *In Exchange.*
8. *The New York Medical Gazette, and Journal of Health.* Edited by D. M Reese, M. D., LL. D. October, November and December. *In Exchange.*
9. *The New York Journal of Medicine and the Collateral Sciences.* Edited by Stephen Smith, M. D. November. *In Exchange.*
10. *The North American Medico-Chirurgical Review.* Edited by Drs. Gross and Richardson. November. *In Exchange.*
11. *The Nashville Journal of Medicine and Surgery.* Edited by W. R. Bowling, M. D., assisted by R. C. Foster and George S. Blackie, M. D. October, November and December. *In Exchange.*
12. *The Medical Reporter.* Edited by Dr. S. W. Butler. Received regularly every week. *In Exchange.*
13. *The Edinburg Medical and Surgical Journal.* Not received. *In Exchange.*
14. *The Cincinnati Lancet and Observer.* Edited by Drs. John A. Murphy and Ed. B. Stevens. *In Exchange.*
15. *The Chicago Medical Journal.* Edited by Drs. N. S. Davis and W. H. Byford. *In Exchange.*

16. *British Journal of Dental Science.* Received irregularly. *In Exchange.*

17. *The Charleston Medical Journal and Review.* Edited by J. Dickson Bruns, M. D. *In Exchange.*

18. *The Buffalo Medical Journal.* Edited by Austin Flint, Jr., M. D. *In Exchange.*

19. *Dublin Quarterly Journal. In Exchange.*

20. *The Dublin Medical Press.* Received regularly. *In Exchange.*

21, *The Peninsular Journal of Medicine and the Collateral Sciences.* Edited by E. Andrews, A. M., M. D., etc. *In Exchange.*

22. *The St. Louis Medical and Surgical Journal.* Edited by M. L. Linton, M. D., and Wm. M. McPheeters, M. D. *In Exchange.*

23. Der Zahnarzt. *Das Neueste und Wissenswürdigste des In—und Auslandes über* Zahnheilkunde. *Redakteur;* C. Schmedicke, *prakt. Zahnarzt zu* Berlin. *In Exchange.*

24. *Medical Times and Gazette.* Received regularly. *In Exchange.*

25. *Annales de la Sociedad de Medicina Montevideana. In Exchange.*

26. *L'Art Dentaire.* Edited by MM. Fowler and Preterre. *In Exchange.*

27. *Dental Review.* London. *In Exchange.*

28. *The New Orleans Medical News and Hospital Gazette.* Edited by D. Warren Brickell, M. D., and E. D. Fenner, M. D. Received regularly. *In Exchange.*

29. *American Dental Review.* Edited by Dr. A. M. Leslie. *In Exchange.*

30. *The Dental Reporter.* Edited by Jno. T. Toland.

31. *American Journal of Pharmacy.* Edited by Wm. Proctor, Jr.

32. *The American Journal of Insanity.* Edited by the Medical Officers of the New York State Lunatic Assylum. *In Exchange.*

☞The plates accompanying the present number illustrate the translation of Magitot, "On the Structure and Development of the Human Teeth," the publication of which was finished in the October number of last year.

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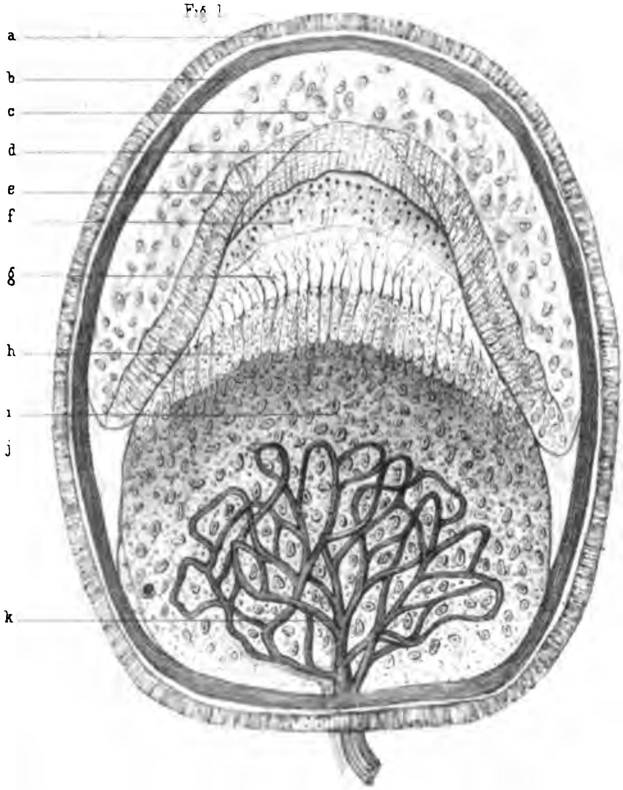

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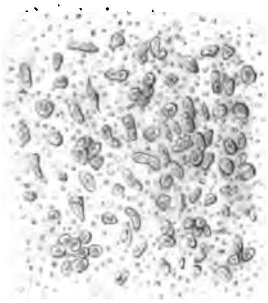

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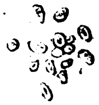

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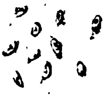

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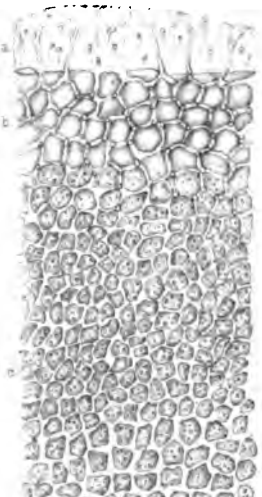

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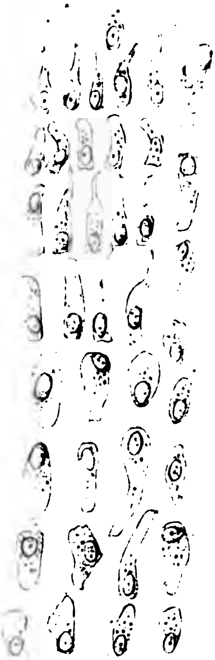

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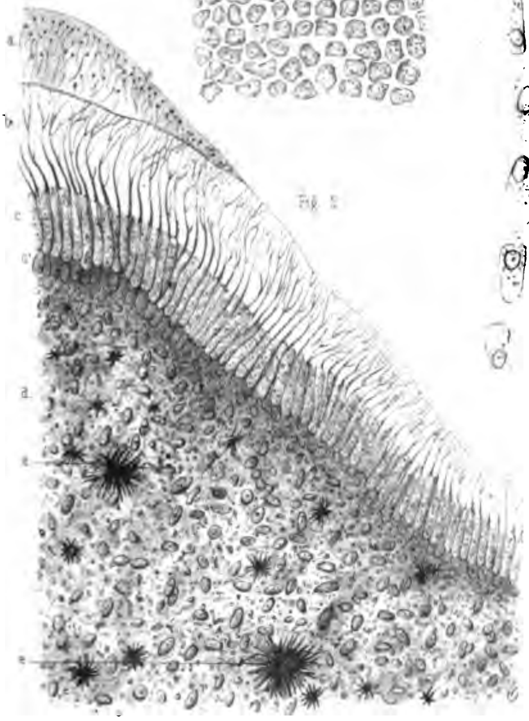

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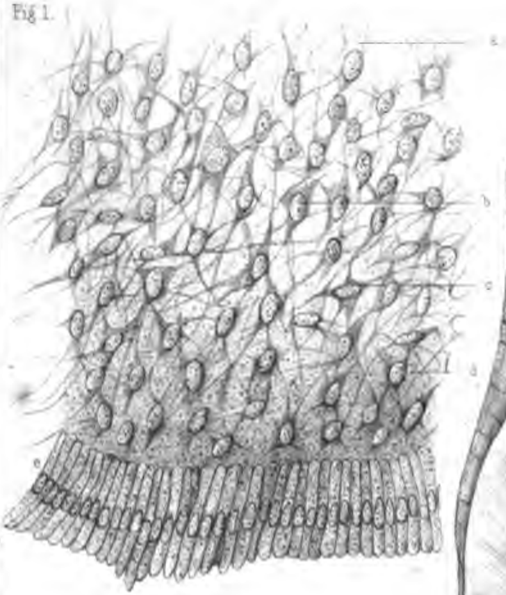

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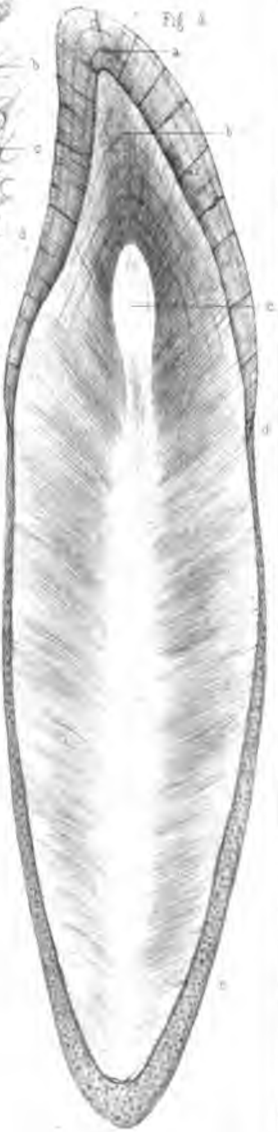

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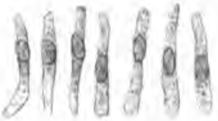

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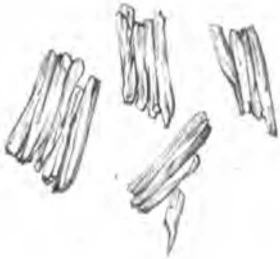

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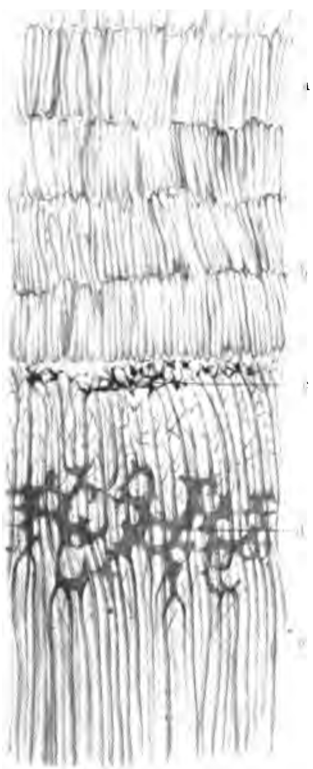

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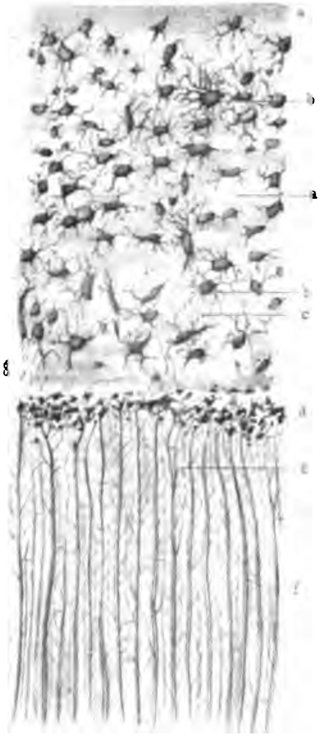

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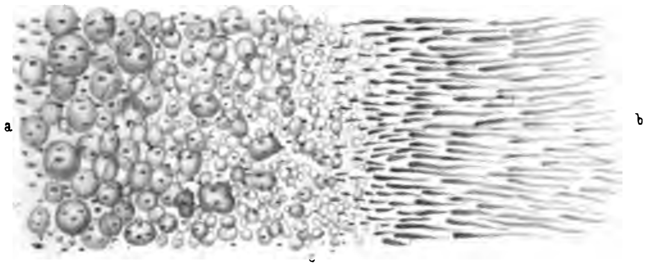

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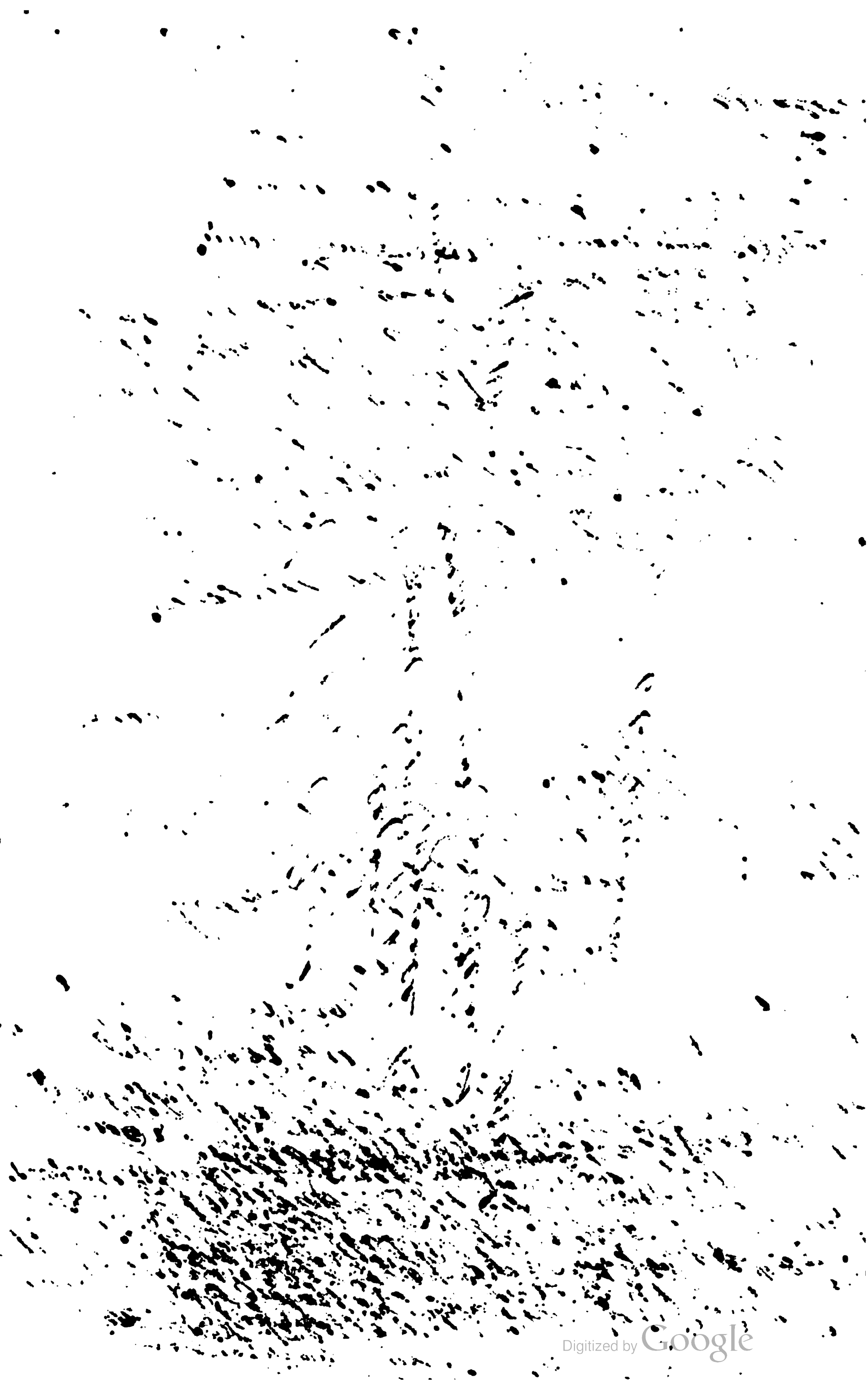

THE

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# ORIGINAL COMMUNICATIONS.

## ARTICLE I.

*Dental Anomalies, and their Influence in the Production of Diseases of the Maxillary Bones.*—By A. M. Forget, Docteur en Médecine, Chevalier de la Légion d'honneur, Lauréat de l'Institute de France, Membre titulaire de la Société Médicale d'emulation de Paris; and Member of several other learned Societies, National and Foreign. Prize Essay of the "Académie des Sciences, March 14, 1859." Translated for the Am. Jour. of Dental Science.

### *Prefatory.*

The bones of the face are subject to certain lesions of vitality and structure which are common to them with those of the other different parts of the body. These lesions are included in the general study of the diseases of the osseous system, and are subordinate to the same histological influences. Some, distinctly marked by the anatomical peculiarities which they present, and above all, by their origin, especially affect the maxillary bones; these we have exclusively to do with in this memoir.

To explain the anatomical and physiological reasons which predispose the jaws to the so frequent development of organic lesions which require the intervention of art, to demonstrate, by pathological anatomy, the causes which produce these lesions, the anomalies of nutrition, and the position of the teeth; to show forth the primordial characters which enable the surgeon to trace these anomalies, and which permit him to arrive at the pathological consequences; and finally, if they already exist and reside in a more or less voluminous tumor of the jaw, to open a way to the diagnostic, which, in rendering the origin and nature of this tumor accessible and palpable, allow of a restriction of the operation simply to the diseased parts, and thus the preservation of the continuity of the bone, which the partial or total ablation would not sufficiently accomplish—such is the end which I have proposed to myself, and which from the public reward bestowed by the Academy of Sciences, I am led to hope I have attained.

## *Introductory.*

Of the different parts of which the living skeleton is composed, there is none which may more frequently be the seat of numerous and varied pathological productions than the maxillary bones, and particularly the inferior maxillary bone.

This peculiarity, if we consider that the morbid aptitudes of any organ of the economy whatever, are in respect to the complexity of its structure and the degree of vitality which it enjoys, would never surprise an attentive observer; it is the natural consequence of a double anatomical disposition proper to the maxillary bones, and to which an entire order of physiological phenomena is attached, for the accomplishment of which an organic activity and nutritive movement is created and sustained in their diaphysis, which is not partaken of in an equal degree by any other point of the osseous system.

Thus these bones offer a protecting canal to a vascular and nervous apparatus, receiving from them in exchange a very great number of nutritive vessels. The presence of the dental bulbs, moreover, which are arranged in the interior of the jaws, there to await their successive evolutions, and remain there till they are accomplished, act as a permanent cause of irritation and of congestion, the intensity and duration of which are in proportion to the slowness the difficulties and the anomalies of development of those osteides.

Now there are also morbid influences, remote, but not the less certain, to which we must refer these diseases, by which, like all organized products, the dental organs themselves are attacked at the different phases of their growth ; and after this isentirely achieved, slight and circumscribed, these diseases most generally pass unperceived, but in some cases, by their persistence, their generalization, and above all, by their extension to the alveolar tissue, they become the point of departure for deep seated osseous lesions for which the intervention of art is necessary.

The analysis of a great number of documents, at present in the possession of science, on the diseases of the jaws, has long since demonstrated to me the justice of the preceding etiological view, and I do not doubt but that whoever desires to study this question of pathogenesis from the same point of view, will be led to partake of my opinion, which will be justified, I hope, by this work which comprises two chapters—the first dedicated to the anomalies of nutrition, the second to the anomalous position of the teeth, and both having in view to demonstrate the connection between these anomalies and different morbid states of the maxillary bones.

## CHAPTER FIRST,

### *Anomalies of Nutrition and Development.*

Of all the observations which will figure in this chapter none seems to me to be more worthy of the first place than that which relates to a young patient whose case I have already had occasion to bring before the Society of Surgery; in a histological point of view, nothing can be more conclusive. It presents, in fact, the anatomical anomaly and the pathological lesion brought together and united in one case—a morbid duality most rare and unique in the human species, if I may judge from the impossibility of finding, in the various treatises of surgery, as well as in the collections of pathological anatomy, a single case which can be compared to it.

*Observation 1st.—Osteo-dental tumor, of the size of a large egg, encysted in the thickness of the inferior maxillary bone. Ulcerous inflammation of the parietes of the cyst. Numerous ossi-fluent fistulas. Resection of the left side of the body of the jaw, and of a portion of its branch. Guerison.*

During the first of the month of May, 1855, M. L., a dealer of the Point-a-Pitre, (Gaudaloupe,) presented his son to me, at the advice of Dr. Lerminier, a learned and experienced practitioner of that city, for the purpose of having him submit to an operation necessitated by disease of the inferior maxillary bone, the first indications of which had been observed at the age of five years.

*History of the Disease.*—At this period, the young L. experienced pains, accompanied by long intermissions, in the left side of the jaw, which continuing and becoming so aggravated, at the age of seven years he was obliged to submit to the extraction of two small molars, although they were perfectly sound, under the idea that they impeded the evolution of the second teeth. This operation produced marked relief; the intra-maxillary pains ceased, but soon after, a small, rounded, hard tumor of the size of a hazel-nut discovered itself upon the external face of the jaw, over the place from whence the teeth had been taken away.

Circumscribed, painless and stationary, the tumor did not make any sensible progress till the eighth year. The whole of the left side of the jaw then became tumefied, so much so that the planes of the bones were, according to the patient, hardened and rounded.

The absence of the large molars on the left side, although they were regularly developed on the right, was a striking attendant circumstance.

The morbid ampliation of the jaw was accompanied at intervals by a fluxionary movement of the gums, cheek, and the whole of the left side of the face. This fluxion, each time that it was produced, was very painful and resulted in sustaining and augmenting the tumefaction of the soft parts, so that the difference in volume of the two sides of the face became very apparent, and constituted a real deformity.

During the month of November, 1854, the swelling became quite large, active inflammation invaded the face of the jaw and the cervico-maxillary region. Antiphlogistic treatment was indicated, and two applications of leeches were made. Fifteen days after the inflammatory symptoms amended, purulent matter formed in the thickness of the cheek, for which an opening was spontaneously made, giving issue to a considerable quantity of fetid pus. The opening of this abscess remained fistulous; the ambient tissues being thin and ununited, and the bone denuded under them to a considerable extent.

*Actual State.*—Young L. is twenty years of age, strong and well developed, and is possessed of an excellent constitution; his general health has not suffered from the local affection with which he is attacked. This latter shows itself exteriorly by a large tumefaction of more than three times the natural size of the left cheek; it has assumed an ovoid form, and impressed a corresponding marked and eccentric development on the maxillary bone. In causing the patient to open his mouth—and this may be done with ease—we may perceive the whole of the left side of the bone, resembling a large turkey egg in form and volume. Thus it follows that the line of demarcation between the internal and external faces of the bone is obliterated, and is now described by a very apparent curve.

The tumor thus constituted is uniform, equal, and without creases or any irregular swelling upon its surface. Hard and resistant, it does not yield at every point to pressure, nor does it give the crepitating noise characteristic of the thinning of the osseous tissue. The exterior projection which it makes, hides the superior and lateral part of the neck, over which it extends several centimetres.

From the side of the mouth, the ampliation of the bone has forced the tongue from its proper direction, and the floor of the buccal cavity falls from left to right.

The alveolar border is singularly enlarged and does not show from the first bicuspid, which is regularly placed in its alveolus, any of the molar teeth where they should be seen. The tissue of the gums, of a deep red color, is thick and indurated. This tissue is interrupted and leaves an entirely naked, grayish, unequal, rugose surface, about as large as a twenty centime piece, which yields a sound like that of the crown of a tooth buried in the alveolus when struck by a metallic probe.

As to the limits of the disease, in front it does not pass the symphysis of the chin, and behind, by the aid of the finger, at the isthmus of the throat, it may be perceived at the posterior border of the branch of the maxillary bone where it is arrested. The upper part of the bone, as well as the articulating condyle, is healthy.

I would add, by way of completing this symptomatic explanation, that at the base of the tumor, several fistulous passages from the bone are to be found. The seat of an old purulent discharge, about two fingers in breadth, may be seen at the left labial commissure; this has caused the thin and violet-colored skin to come off for an extent of some four centimetres; finally, several of the sub-maxillary lymphatic ganglions are notably hypertrophied and indurated.

As to the functional troubles caused by the pathological condition which preceded, from having been slight at first they daily became more decided; thus phonation is embarrassed, mastication is painful and incomplete, deglutition is often only accomplished with difficulty, and respiration becomes difficult every time an inflammatory exacerbation attacks the tumor and the soft parts which confine it. In conclusion, the patient suffers from two very grave inconveniences, resulting from the very marked deformity of his face, and from the incessant flowing of a fetid pus proceeding from the complicated fistulas of osteo-dental caries.

*Diagnosis of the Disease.*—After this exposé of the historical details of the disease, and the symptomatic traits which characterise it, the question which naturally presents itself to the mind is relative to the diagnosis, the solution of which prescribes the therapeutic indication to follow.

Now, an analysis of the preceding observation places one important fact strongly in relief, which, in my mind, touches the origin of the evil, and allows one, in consequence, if not to determine its more intimate character, at least to apprehend the initial point of departure. I refer to the relation existing between the appearance of the inter-maxillary pains and the time of life when the work of second dentition being in progress, the jaw became the centre of fluxion, determined and carried on by the excessive nutritive movement of which it was then the seat. Thus at five years of age young L. experienced the first painful attacks of his malady, of which nothing then indicated its future development and gravity. A little later, that is at seven years of age, precisely at the time when the growth of the dental bulbs has been completed by their alveolar eruption, the pains recur with such intensity that the extraction of two healthy teeth is judged necessary; the effect of this operation was only palliative, and it was soon followed by a new morbid manifestation in the appearance of a small tumor.

Let us add, if these remarks have not already established the histological connection I have in view, that this latter will soon become more evident if we look several years later when the absence of the larger molar teeth can be proven, their development never having taken place. Between this anatomico-physiological observation, the morbid accidents which have preceded it, and the evolution of the pathological fact which is now manifested by a voluminous tumor, it seems to me that something more exists than a mere coincidence; to me an intimate connection appears to occur, if not of direct causality, certainly of reciprocal influence.

But if it is easy to rise to the origin of the evil, is it equally so to determine upon its nature? This aspect of the problem unquestionably offers the greatest difficulties, although the proofs furnished by observation have led me to believe it not insoluble.

Thus, taking into consideration the slowly progressive mode of development of the tumor, the regular uniformity of its exterior aspect, the exact circumscription of its very clearly defined limits, the consistency and firmness of the different points of its surface, which is bounded on all sides by an osseous frame work, I do not hesitate to state the existence of a pathological product which has taken birth in centre of the body of the maxillary bone, the eccentric development of which had followed the growth of this product in such a manner as to enclose all parts of it as in a true cyst; this arrangement in all respects resembles that which I have frequently observed and which I described during 1840 in my inaugural thesis,* under the designation of *osseous cyst* enclosing a solid product. As to the intimate composition of this cyst, I did not believe that it was possible to have a very precise knowledge of it; also, without pronouncing upon the nature of the anatomical elements which constituted the pathological aggregate, I confined myself to diagnosticating the existence of an oméomorphous tissue at the centre of the maxillary bone; considering the hypertrophy of the cervical ganglions as the result of a sympathetic irritation and not as the symptom of the cancerous infection already in progress. The former (the sympathetic irritation) was hardly admissible in the presence of the flourishing health of M. L. If the disease with which he was attacked had been characterised by this malignity it would have resulted differently, and in the space of twelve years which have elapsed since its appearance, it would have produced those more considerable local disorders and would have exercised a deleterious influence upon the physiological development, and likewise upon the constitution of the subject, the effects of which would not have been so slow to manifest themselves.

---

* Recherches sur les kystes des os maxillaires et leur traitement, 1840.

The question of diagnosis to us is always too grave in such a case and its solution of too high a practical interest for me to consent to report simply my own judgment. I therefore called in two of my colleagues of the Society of Surgery, MM. Michon and Denonvilliers, who, after examining the young L., partook of my opinion upon the mode of development of his disorder, its nature presumed, if not evident, and upon the necessity of a resection of a part of the body of the jaw, an operation which I performed on the 16th of June, 1855, with their assistance and in the presence of MM. Pinel de Golleville, Mongeal and of M. Felix Baudoin, a distinguished student of the hospital of Paris.

*Operation.*—The patient was placed upon a bed on his right side, the head elevated and resting upon a tolerably hard pillow. I commenced the operation, situating myself in front of the patient, after having submitted him to the inhalation of chloroform. In order to turn the base of the tumor I commenced an incision in front of the base of the ear and extended it to a distance of about one centimetre from the projection of the chin on the right side of the jaw. By this I circumscribed a large flap, which, when I had dissected and reversed it upon the cheek-bone, was found to consist of the whole thickness of the cheek and a portion of the lower lip. The dissection of the soft parts was unavoidably long, as well on account of the close attachments of these to the surface of the bone, as on account of the ligatures necessitated by the section of several arterial branches.

The flap being fastened up, I sawed the bone in front upon the alveolus of the canine tooth which I had previously removed. Behind, the saw intersected the maxillary at the point comprised between the angle formed by the branch of the bone and the origin of the dental canal. For executing this part of the operation, I used a chain-saw; the play of this instrument was interrupted, however, in front by an unforeseen obstacle which nevertheless I eventually surmounted; this was the presence of a tooth placed horizontally in the thickness of the bone and precisely under the alveolus occupied by the track of the instrument.

*Excision of the Tumor.*—When the osseous tumor was isolated by these two applications of the saw, I proceeded to detach the inferior parts by dividing all that part of the floor of the mouth corresponding and adhering to the internal face of the jaw, with a bistoury. In order to accomplish this, an assistant having seized it with flat-bladed pincers, and holding it turned inside out, I made an incision, from front to back, through the muscles of the sub-maxillary region, taking care constantly to turn the cutting edge of the bistoury against the tumor, thus avoiding the base of the tongue, and, above all, the anterior pillar of the veil of the palate which, as I remarked in the symptomatic exposé of the observation, marked, behind and within, the limits of the morbid development of the jaw. This division of the lower tissues necessitated several ligatures around the divided branches of arteries, after the tumor was raised; I also introduced a small ball of wax into the orifice of the open dental canal in the cut face of the bone and thus put a stop to the hemorrhage arising from the dental artery.

In order to complete the operation and leave in the wound no tissue of a suspected character, I dissected and raised up two lymphatic ganglions situated under the tongue and above the genio-hyoid muscles and the anterior belly of the digastric muscle. This done, I waited some moments before proceeding to dress the wounds, which I commenced only when I was assured that all danger from hemorrhage was over.

The flap, left to itself, by its own weight, entirely recovered the solution of continuity. It was also easy to bring the edges of this together and maintain them united by means of the twisted suture, the points of which I arranged to the number of sixteen, in such a manner as to leave an opening in the lower part through which I placed a thread ligature and by which the purulent fluids found a permanent and easy issue. A perforated compress and a cerate plaster, a pledget of lint soaked in cold water, and over all a chin-piece completed the apparatus applied.

*Remark.*—To effect this resection by the process I have made use of, and which has for its object to preserve the lowerlip intact instead of dividing it in all its height by commencing an incision upon its free edge, it is important to take care in the formation of the flap; it is necessary to give sufficient extent to the incision which determines the length of the flap to allow of the introduction and use of the chain-saw without impediment. If it were found necessary to formularise a rule bearing upon this point, I should say that instead of arresting one's self on the limits of the tissue to be removed, it would perhaps be better to extend the incision in front as well as behind, two or three centimetres beyond. The dissection of the soft parts also might be carried farther and by this a much greater separation of the borders of the solution of continuity might be obtained at their angles; this would permit the surgeon to maneuver easily with the chain-saw.

*After the Operation.*—During the operation, the pains of which were but feebly mitigated, the continued inhalation of chloroform having been rendered impossible from the nature of the case, the patient showed great courage. After it was over he was faint, and very pale; his pulse slow and feeble. Having been taken to his bed, his head elevated and reposing on a horse-hair pillow, he was not long in going to sleep. In an hour he awoke and vomited a large quantity of blood without any effort to expectorate; until evening he rested in a somnolent and prostrate state; then, during two hours, several spoonfuls of bouillon were given to him and in the interval wine-water. At eight in the evening the reaction had fairly taken place; the skin was warm, the face animated, and the pulse indicated 106 pulsations a minute.

*The day after the Operation* (*17th of June*).—After an agitated night, the fever became intense, (pulse at 130.) The patient had not urinated for twenty-four hours; the epigastric region was tense, no pain, and percussion left no doubt as to the considerably enlarged state of the bladder. I made an effort to use the catheter but the spasm of the urethra rendered it so very painful that I did not insist; I prescribed camphorated oil, however, upon the hypogastrium, to be followed by the application of a large cataplasm. This had the result which I intended; at the end of two hours the patient urinated freely.

On removing the covering the wound appeared in a satisfactory condition; no tension, swelling, or isolated redness appeared along the line of the sutures. Adherences having taken place at the point which I had intended to leave open for the free escape of fluids, I destroyed them with the extremity of a probe; I also moved the pin nearest to the symphysis of the chin. The same dressing was applied which was used the day before; for diet-drink, gum-water was directed with instructions to persevere in a strict diet.

*18th of June.*—The febrile movement continued intense through the night; the pulse at 135. The patient has been very restless and has not slept. Now the pulse indicates 120 pulsations, small, hard, and depressible: the heat of the skin is moderated; the patient signifies that he feels better, but complains most of the fatigue caused by the constant spitting of bloody saliva. I removed all of the pins except three at the small part of the wound: a simple dressing is substituted for the application of compresses soaked in cold water. Chicken broth is directed, and an opiate drink for the night.

*19th of June.*—The fever has diminished; pulse at 90; I removed the three last pins, and by moderate pressure directed from the base towards the perimeter of the flap, I caused an abundant flow of pus of good quality through that point of the wound where the ligatures were placed. Prescribed broth, a feculent potage.

*20th of June.*—Condition same as yesterday; the night has passed calmly with prolonged sleep. The edges of the wound have completely united along its anterior third.

*21st.—Sixth day after the Operation.*—Sensibility exist in the neighborhood of the wound without any elevation of the pulse.

*22nd.*—During the afternoon of yesterday, the patient had a severe chill with violent headache and coldness of the lower extremities. Fever followed the chill and the pulse rose to 130; it is now slightly reduced. In removing the dressing I found the cheek tumefied, hot, red and painful to the touch, with all the symptoms of an erysipelas in process of development. As to the erysipelas, as the evident sign of gastric embarrasment to which I apprehended a certain degree of gastro-intestinal irritation was connected, I combated it exteriorly by the use of mercurial ointment followed by collodion, the first having been lost interiorly, by saline purgatives and diluent and acidulated drinks.

*24th and After.*—Notwithstanding the treatment employed, the erysipelas continued its invading march, causing at first very intense febrile excitement. Starting from the left cheek, it successively attacked the wing of the nose, the eyelids, the temple and that hairy portion of it which should be shaved, finally limiting itself behind along the line of the occipito-parietal suture. From the left side it passed to the right and appeared upon the other cheek having taken ten days in accomplishing its peregrinations. This circumstance of the case terminated, however, convalescence took place easily and rapidly. Reparative aliment, given with prudence, quickly restored the patient's vigor. For several days this consisted of soups, juices of meats, jellies, and a little later I permitted solid food. On the eighth day following the operation, young L., could easily eat bread, meat, and other articles which require efforts of mastication.

Towards the last of July, I presented M. L. to the Society of Surgery. The cicatrix of the operation was linear, the face showing no appreciable deformity. Looking at this young man in the face, one would be unable to perceive that he had lost so considerable a portion of his lower jaw.

(To be continued.)

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## ARTICLE II.

### *Artificial Dentures.* BY DR. J. ALLEN.

ALTHOUGH more than two thousand years have passed since artificial teeth were first worn by man, and although a variety of methods have been introduced within that period of time, still there are errors, (whatever be the mode) to which the writer deems it proper to refer, in a series of articles upon this subject.

In taking a retrospective view of the past, we find that since the establishment of dental colleges, dental journals, and dental associations, in America, greater advances have been made in dental science, than during the previous twelve hundred years. Hence the universal concession that American dentists stand the highest in their profession.

Not that all these advances, or improvements, have emanated directly from these sources, but they have been instrumental in diffusing light to the profession, and light reveals principles which beget thought. A principle may be discovered and proclaimed by one person, which is often carried out and rendered practical by another, and again, modified and clothed with a different garb by a third. These means of diffusing knowledge, cause ideas to germinate, bud, bloom, and mature into substantial realities. Although much has been done in the construction of artificial dentures by means of the various devices which have been conceived and brought into use for this purpose, yet there are many errors, into which the dentist almost imperceptibly falls, either from want of sufficient perception to see the end in the beginning of his operations, or from a degree of carelessness in his manipulations, either of which may prove fatal to a practical result. To some of these errors we will briefly refer and endeavor to point out the remedies. There are those who attach too *much* importance to some favorite method, and too *little*, to its execution. They seem to think that this or that particular *mode* will almost do itself, and that all the genius, skill and judgment, that were necessary to be expended upon it, had been embodied in developing the *mode*, and the operator has only to employ it in order to produce a perfect result. This is an error and should be the first corrected. There is no one method, that has yet been discovered, so perfect as to render the exercise of taste, skill, and judgment, unnecersary on the part of the operator. There are no mouths so near alike as to admit, of duplicating artificial dentures, and have them properly adapted to different persons. Almost any other manufactured article can be multiplied ad infinitum, but artificial teeth must be varied to suit the requirements of each individual case. Hence the importance of the combined skill of the mechanist, the artist and the dentist. If the operator is deficient in the first of these requirements, there will be a want of utility in his operations. This may arise from various causes; for example, suppose the teeth be placed too far out upon the base which would bring the pressure (when the teeth are closed) outside of the alveolar ridge. This is a very common error, and often defeats a good practical result.

The skillful architect builds his superstructure perpendicularly over his foundation, lest the weight or pressure should overhang the base, and cause it to give way.

The same principle should be observed in the construction of a set of artificial teeth. They should be placed as nearly as possible, perpendicularly over the alveolar ridge, with the pressure resting upon the inner, rather than the outer cusps of the molars and bicuspids when the teeth are closed. This will secure not only strength to the denture, but also prevent the plate from becoming dislodged from one side, when chewing upon the opposite. Again a denture may be defective from an imperfectly fitting plate. If a zinc cast be used for swaging, the shrinkage of the metal will often prove sufficient to prevent a perfect fit to the mouth. To remedy this, another die should be made of fusible metal from the same plaster model from which the zinc one was formed. With this fusible die, the plate should again be struck, and if done with care, the plate will then be formed to fit, provided the impression was good. The fusible metal shrinks less than the zinc and is the best to be used for the last striking of the plate. The operator may also fail in the adaptation and arrangement of the teeth. If they are too light, they present a cold ghastly appearance which leads to detection.

They should possess a depth of tone, and shade, that will harmonize with the tinge of the lips, and complexion of the person for whom they are intended. If too dark, they exhibit a dirty and unhealthy appearance. If the teeth are set very true and even, they will appear stiff, and mechanical, and serve as a walking advertisement for the dentist who inserted them. They should be gracefully irregular, so that each tooth may display its natural individuality.

The expression of the teeth gives character to the physiognomy of a person which may be varied by longer or shorter, larger or smaller, prominent or receding teeth, either of which may produce harmony with the other features of one person, and distortion in the mouth of another. Careful discrimination and good judgment must decide as to the style and character of teeth that will give the best expression under the circumstances that govern the case. The teeth should be long enough to sustain a due proportion in the length of the face, and also display an agreeable and natural expression, and short enough to allow the lips to close over them without restraint, or undue muscular effort.

Another very common defect in the construction of artificial dentures, is that of *not* restoring the natural form of the face in cases where it has become sunken.

Some attempt to accomplish this by placing the teeth far out upon the plate, and thus sacrifice utility for appearance, which they fail to attain by this means, for it requires something more. When the muscles of the face have become sunken, they should be brought out to their original fulness, by means of attachments to the denture of such form and size, as to restore a symmetrical contour to the face, these attachments may be made of substances which can be united to the base plate and teeth in such manner as to become permanent fixtures to the denture ; the writer forms them exclusively with the materials used for his continuous gum work ; they are built out, carved, and baked upon the denture, of such form and size as may be indicated by wax, previously formed in proper shape upon the piece, when in the mouth of the patient. The skill of the artist is here brought into requisition, for he displays his talents upon the living features of the face; he should know the origin, and insertion, of every muscle of which it is formed, and what ones he is to raise, and where to apply his attachments, or he may produce distortion instead of restoration, by allowing them to underlay other muscles than those intended to be raised.

If skill and judgment have presided over all parts of the operation, the result will be highly pleasing and of practical utility.

[To be continued.]

## ARTICLE III.

### *What is Quackery? And who art Quacks?*

*To the Editors of the American Journal of Dental Science.*

"Is there a hole in a' your coats,
I rede ye tent it,
A chiel amang you taking notes
And faith he'll prent it."—*Burns.*

SIRS:—Though so much has been written to elucidate these questions, there is still great ambiguity in their use.

Having an intuitive dislike to quackery of all kinds, from the immoral consequence, which result either to the actors or their dupes, it is my intention to add a few thoughts on this important subject. But in a paper of this kind, I shall not enter into the peculiar mental constitutions

"Of the cheated and the cheats,"

merely remarking, *en passant*, that the predisposing tendency in professors of this class is excessive cupidity and deficient conscientiousness, whilst most of their victims possess large *marvelousness* which is stimulated into a feverish activity by the extravagant boasting of those who intend to profit by their credulity and if these unreflective believers think at all, it is evident they conclude "that where there is so much smoke—there must be some fire." Yet in order that the reader may understand the sense in which these terms are used, the definition is simply that "Either some great *profession* is made which the boaster knows can never be realized. Or else the quack is so stolidly ignorant as to be incapable of distinguishing the difference between the accidental and the consequential, for as he is without any theory or positive knowledge on the subject he professes to treat, he is liable to mistake some fortuitous result in reference to some special case as applicable to all others, even when positively dissimilar, and that without reflecting on the difference in age, sex, and temperament, which in medicine (as with food) requires some modification in the treatment.

Thus the charlatan acts without any real knowledge, and at variance of the experience of the studious observer of diseases and their phenonomena. And when he dispenses his *specific*, it is to gratify his inordinate avarice, even if it proves injurious to his confiding victims. And though he may become cognizant of the fact, still he continues with unblushing impudence his unprincipled conduct. He is both a cunning and mendacious personage, whether he has a degree indicating his positive or superlative ignorance—yet if he wears this *badge* of his order, he exults in his infamy, though good men shun and execrate him.

There have been, however, many highly gifted men who cured diseases *empirically* at all periods of European history, who had never devoted themselves to the special study of the physical sciences or natural history, and who yet observed many facts in both. These self-taught students were *not* quacks :—their college was the vast temple of the living God! Their books were the different pages of the sublime volume of the universe. Their *curriculum* embraced clear observations on all phenomena affecting health and disease, which are in common parlance called the "laws of nature," without having in all human probability, learned the technical phrases to indicate the difference of structure which are patent in both states, but which still they mentally distinguish.

In modern times, there are some men who have obtained a rank in science by their own labor and diligence; and whose lives have shown, that they had been impressed with the *dignity* of knowledge, and have preferred poverty with rectitude, rather than purchase rank or wealth by any compromise of their moral consistency. Surely, none of the latter can be consided quacks.

On the other hand, are there not many who have had every advantage, and who nominally assume the rank of surgeon or physician? having luckily passed from some *laxity* or favoritism of the examiners, who ought to have regarded them as absolutely unqualified for such a profession. Their practice must therefore be of a mere routine kind—the disease and the dose—and they are likely to misunderstand the one and overdo the other. And all these dangers result just because they are incapable of distinguishing between the symptoms and the causes! How should they, when they have never consumed "the midnight oil," or read a single leaf of the *arcana* of nature. They are satisfied that *their* road to success does not depend on knowledge, but upon the meretricious circumstance of having a good connection or *plenty* of money. And if they may not have the last solid qualification—they may be patronized by some twig or branch of the aristocracy.

*Quackery* is therefore what I have defined it to be, the offspring of ignorance and cupidity. But in saying this, it is essential to distinguish between positive ignorance, which is owing to an insufficiency of all real knowledge, and which might have been obtained by ordinary industry, and that *negative* ignorance induced by the almost inseparable difficulty of investigating the processes carried on in "nature's laboratory," in mysterious silence, and which, may be, depend on causes undefined and thus designated "occult."

Unless some such broad distinction is made, the term quackery might be applied to everything, of which all that was known of it, was derived from mere experience? For the term *quackery* and *empiricism,* are used synonymously, as expressing one condition. But this would be a too sweeping definition, and would implicate every regular professor of medicine. For if any one of the most gifted practitioners were asked to give the *modus operandi* of calomel, and why it acts on the liver and affects its secretions? He could only answer, "we know it by experience." The same might be said, if the question referred to the sedative effects of opium—he could but say, "we know it is so!" and so forth.

And, as the word SCIENCE means simply knowledge, yet, it is knowledge arranged and systematised. And this very collocation explains that its details are obtained from different observers. Therefore, for all practical purposes, it may fairly be said "that *quackery* should be applied to extravagant promises, which it is impossible to realize."

In dental practice this is a well-marked distinction—for pledges are made of doing wonderful things with a consciousness of the absurdity of such mendacious statements, and which the really scientific never are guilty of making.

The scientific dentist, like the medical practitioner, knows that different persons require particular treatment; and that there are particular idiosyncrasies which form altogether exceptional cases. Like true modest men of science, they know how much of obscurity exists in many special diseases, and hence they never speak of anything as a specific. In toothache, for example, what is a "cure-all?" Turpentine will allay the *neuralgic* pain in one, and drive another nearly mad. The same may be said of all the other "remedies."

Although it is then justifiable to state what science and experience teach, but still, the more any one knows, the more cautious he is not to promise extravagantly. "He will try to cure." "He hopes to relieve." "He thinks it is very likely that the patient will soon be free from pain." &c.

The quack does just the contrary—he speaks with a bombastic certainty, strokes his beard, as if to draw inspiration from it and not his brain, and swaggers about his great acquirements and his superlative superiority, and all in the actual ratio of his profound ignorance. And in so doing he excites the fears of his dupes and succeeds in "putting money in his purse." He is too obtuse to care for "character," and he is satisfied even if his victims *curse* him "not loud but deep," so that he can rattle his pocket and feel their *golden* contributions. The quack has therefore no subsequent misgivings, and the only thing that disturbs his self-complacency is "the fear of the law," and the dread that he will have to refund his ill gotten and extravagant fees.

Should his victims make no attempt to expose and punish him, he goes on with greater recklessness, and every subsequent imposition deadens the little *morsel* of sense he may have had when he entered on his unprincipled vocation. He fattens on the ignorance and credulity of those whom he, spider like, drags into the meshes formed by his cunning and avarice, and he then will, without remorse, squeeze from them their last guinea, with as little compunction as that sanguinary insect does to the last drop of blood of some silly, thoughtless fly caught in his web.

Two modes of prevention may be indicated, not only to put an end to the immorality of quacks, and the suffering and disappointment of their victims, which are simply the following:

1st. By means of making physiology a part of the education of all classes. Just enough, by means of models, that they may learn the marvellous structure and complexity of their frames—the seat of the vital organs, and a popular exposition of digestion, nutrition and assimilation, &c.

If such were the case, and any symptom of disease afterwards was manifested, it is improbable that any ignorant charlatan would be applied to, but only such practitioners as were well acquainted with the mechanism of the human body.

2d. In all civilized countries no one should be allowed to practice (under the liability of severe penalties) if he had not undergone a rigid examination as to his theoretical and practical knowledge, where especially, as in dentistry, proficiency in the latter is so imperative for the comfort of his patients.*

In the absence of these distinctive and conservative arrangements, it should be decided to place any one convicted of quackery in a sort of "MORAL PILLORY," (without using the offensive missiles used in the ordinary one,) but the delinquent should be attacked most pungently with the hope that "the still small voice" might awake in him some remorse for his misdeeds, and make him turn from his evil ways.

If all these means are neglected, quackery will and must continue, and the repetition of the acts of the dishonest will tend to render callous the consciences of the professors of this "black art," and they will continue to enjoy their ill-gotten wealth, because those victimized give them an impunity from a false delicacy. Thus they not only do actual injury to those whom they have cheated, but they indirectly injure respectable and upright men practicing in the same special practice. In the profession of dentistry this is notorious. The people who have suffered from the ill-treatment of unqualified persons form a bad opinion of the art itself, and regard all belonging to this branch of practice as not over scrupulous. The *few* who are regarded as probably *exceptions*, are those who get the "lion's share" of patronage among the most educated classes.

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* Candidates for membership of the College of Surgeon Dentists in England were received without any examination, either anatomical, physiological, pathological, or mechanical.

If you think these remarks worthy a place in your excellent Journal, I shall be obliged by your inserting them.

I am, sirs,
Yours, respectfully,
J. L. LEVISON.

**7 Wentredge Villas, St. John's Wood, London, Aug. 1st, 1859.**

## ARTICLE IV.

### *Case.* By DR. F. GORGAS.

ABOUT five months ago, a gentleman engaged in teaching came to my office to consult me, concerning the correction of a difficulty he labored under in articulating.

Upon examining his mouth, I found that the superior centre and lateral incisors had been separated some one or two years before by filing, for the space of one-tenth of an inch. By this operation the decay had been arrested, but at the expense of a goodly portion of each tooth filed, and the difficulty concerning which he came to ask my advice.

It at once occurred to me that the insertion of sections of teeth upon a gold plate, filling up the vacant spaces, would answer the purpose, as he was very anxious to preserve the teeth that had been filed, they being free from decay.

This was an original idea, as I do not recollect ever having heard of an artificial denture constructed in this way and for this purpose.

My first operation was to file the approximate surfaces of the teeth, so as to make the spaces between parallel. After this was done, the teeth not being as sensitive as I imagined they would from so much filing, I took an impression of the mouth in gutta-percha, and swaged up a gold plate, allowing it to extend between the filed spaces in the same manner it should do over the alveolar ridges, where an entire tooth was to be inserted.

My next operation was to carve sections of teeth suitable for the purpose, and to insert in them small pieces of platina to answer the place of rivets, bent so as to hold firmly in the teeth. Upon these platina backings I melted gold scraps.

It was impossible to use common plate teeth ground sufficiently small to enter the spaces, as it would have brought the rivets so near the ground surface as to take away the strength required. It was also necessary to have the spaces between the teeth perfectly parallel, so as to insert and remove the piece with ease.

This piece I inserted upon clasps. Some three months after this piece was made, a friend of my former patient, also engaged in teaching, and like him laboring under the same difficulty, came to me for a similar piece, that of his friend answering so well. For him I inserted two sections of teeth also, and two first bicuspids on an atmospheric pressure plate.

I used an atmospheric pressure plate in this case because all of the bicuspids and molars remaining in the mouth were filled, and consequently not fit to be clasped.

In this case the sections of teeth inserted were not more than one-twelfth of an inch in width.

This last piece has now been worn one month and a half, and as far as I know, has also given satisfaction.

## ARTICLE V

### *On Filing Teeth for Superficial Decay.*

By Jno. McCalla, D. D. S.

In looking over the proceedings of the late American Dental Convention at Niagara, we find the following question proposed for consideration: "under what circumstances, and in what manner, should teeth be filed to remove superficial decay, or preparatory to filling, to leave them the most secure from future decay?" The proposition assumes that teeth *should* be filed for superficial decay, but the manner in which it should be performed, and the circumstances calling for the operation, was left for the convention to determine. The question was not kept clearly in view, in the discussson which followed, and the subject was finally disposed of by a vote in favor of filing for the removal of superficial decay on the approximal surfaces of teeth. From this decision, we beg leave to dissent, in so far as it is intended to furnish a *rule* for those who look to our dental conventions for sound doctrine in regard to dental practice. In deciding when to file for superficial decay, we should be governed by the following considerations: first, the age and temperament of the individual; second, the habits in regard to cleanliness of the mouth, and third, the extent of decay to be removed. In regard to the first, or physical characteristics, we shall adopt the classification of "Harris" as the standard, and remark, that where the conditions are favorable, teeth of the first class are fit subjects for the file, when judiciously employed; by judicious, we wish to be understood, that the decay should not extend through the enamel, that the least possible space should be made externally consistent with the thorough removal of all the decay, the sharp edges of the aperture removed, and the parts left, not only smooth, but completely condensed and burnished. We met with a case some years ago, answering in a degree to this description, which had been filed for superficial decay, by Dr. Leonard Koecker, thirty-eight years before; the teeth were somewhat mutilated, but in a perfect state of preservation, such cases however may be considered exceptions to the rule; in the same space of time that we have met with a few such instances, hundreds have come to our knowledge of irremediable injury having been produced by similar operations. In teeth of a less degree of density, the liability to farther decay is increased in proportion to the degree, while the space left for the formation of a suitable cavity for filling is so much abridged by the previous filing, as to bring us into dangerous, if not fatal, proximity to the pulp, an event not beyond remedy it is true, yet always to be deplored.

It has been adduced in favor of filing for superficial decay, that the Brahmins of India file their teeth even at an early age, yet they seldom, or never decay. When we take into consideration that the care which they bestow upon their teeth is inculcated from infancy with the binding obligation of a religious duty, the argument loses much of its force; few of our patients, with all the advantages of a higher civilization, could be induced to devote an hour or more every morning, as they do, to the purification of the mouth. It is well known too that the teeth of Americans rank much lower in the physical scale, than those of the people just alluded to; with the causes producing this difference we have nothing to do at present, but offer the fact as another argumet in favor of our position. The result of our observations in relation to the operation under consideration is, that while we look upon the file as indispensable in dental practice, there are comparatively few cases of superficial decay presented to our notice calling for its employment, we prefer to wedge teeth apart, and if they are not sufficiently decayed for filling, cleanse and burnish the parts, enjoining strict cleanliness and the importance of having them frequently inspected.

## ARTICLE VI.

## *On the Continued Growth of the Incisors in Rodents, and their Reproduction, considered in Reference to their application to the Study of the Comparative Anatomy of the Teeth, preceded by some New Researches upon the Origin and Development of the Dental Follicles.* By J. E. OUDET, Docteur en Médecine, Membre de l'Academie Nationale de Médecine, etc., etc. Translated for the American Journal of Dental Science.

### *On the Continued Growth of the Incisors in Rodents.*

### 1.—*Origin of the Dental Follicles. Epoch of their Appearance.*

RELYING upon the light which experimental physiology and comparative anatomy have furnished, I have demonstrated, during the past twenty-five years, that studied in respect to the organic acts which preside at their formation, the teeth belong to the mucous system like skin, horns, hair, nails, etc. Now, I shall show that the same analogy exists in the first anatomical disposition of the organs which produce these divers substances.

The follicles which accompany the two dentitions are not formed at the same time, and do not effect the same arrangement. Toward the commencement of the third month after conception, each cavity of the two jaws contains four sacs, of which two anterior and two posterior, adoss equally by pairs one against the other so as to leave a tolerably large interval between the two anterior and the two posterior sacs. The first are the smallest and appertain to the temporary incisors; the others belong to the molars of the same class (temporary.) At the last of the third month, towards the middle and behind the interval which we have indicated and which is marked by a prominence of the external layer of the maxillary bone, a fifth sac, for the canine, may be discovered, which completes the whole number of the follicles for the temporary teeth.

The development of the follicles of second dentition is announced, towards the last of the fourth month, by the appearance of a sixth sac at the bottom of the depression or groove which represent the interior of the jaws. This sac appertains to the first large molar. The capsules of the secondary incisors are only distinctly perceivable, during the seventh month, and still later those of the canine. At the period of birth, all these little sacs exist, glued against the follicles of the temporary teeth ; it is necessary, it may be here stated, to take some precautions in order to discover them. The best way is to remove the internal layer of the maxillary bones ; we then find, at the superior part and posterior to the sacs of the incisors and of the temporary canines, an equal number of other little sacs which correspond to them and which we soon recognize, after having incised the posterior face of their capsules, to be the follicles of the incisors and permanent canines. These sacs are more elevated than the others, and are situated very near the gums with which it is easy to remove them, if attempted with care.

The pulp of the permanent incisors is then very much developed and its configuration entirely marked out. That of the canine is much smaller and less advanced. These sacs are only separated from the follicles of the temporaries by a very slight fibrous layer and are contained in the same alveolar cavities. As to the follicles of the bicuspids which M. Serres says he has proved the existence of in the fœtus, and which he indicates as situated under the germs of the molars of the first dentition, notwithstanding the numerous dissections which I have made, I have never been able to meet with except at a much more advanced period. The follicle of the anterior bicuspid, ordinarily preceded by several months by that of the second permanent large molar, can be perceived at the last of the second year, but oftener during the third, and is soon followed by the follicle of the posterior bicuspid, these follicles of the bicuspids moreover, have primitively the same relations to the gums as the follicles of the incisors and permanent canines. At first they adhere very slightly but equally to the internal border of this membrane; they acquire additional volume, however, gradually ; they elongate and seem as if suspended to the gums by a very delicate and short cord formed by their external envelop which will eventually, by a greater extension, constitute their appendage. At this epoch, they correspond to the internal face of the roots of the milk molars vis-a-vis to the interval which separates them ; as dentition proceeds they continue to descend toward the bottom of the alveoli and finally arrive at the bottom of the vault formed by the roots of the teeth. I have never found the follicle of the third large molars, at least distinctly, before the age of nine or ten years and sometimes later. However, on following the nervous filament, which is intended for these teeth, in the jaws of young children, I sometime since recognized and published* that, at the place where it joins the gum, I had remarked a swelling having some resemblance to a nervous ganglion ; but I only dared to affirm that this was the follicle of the wisdom tooth. These facts have not remained sterile, and soon I shall make some new researches to which they may conduct me.

Such are the dental follicles as they appear, in the interior of the jaw, when they have acquired dimensions which render them accessible to our means of investigation. The time of their appearance, following the same order according to which they succeed each other, presents numerous differences by which we explain those so frequently reproduced in the eruption of the teeth. They are such that, to confine myself to the results furnished by anatomical observation, I have only been able to assign general terms to them, more or less approximative. There are unquestionably those difficulties, joined to those which arise from the delicacy of the parts which have to be studied, which, reasonably enough to us, occasion the discords among anatomists on this subject. I should not blame them for this if I were able to fall in with a small number of authors who have verified for themselves the facts which they describe—the greater part seeking to disguise their plagiarism by greater or less modifications. For myself, I prefer the author of the *True Anatomy of the Teeth;* he copies a celebrated anatomist at least for the accuracy, and leaves to future writers to ask him if anatomy is not indebted to Urbain Hèmard for the beautiful researches upon the dental follicles which had been before made by Eustachius.*

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* Dictionnaire de Médicine, ou Répertoire Gènéral des Sciences Médicales, t. x. article *Dentition*, p. 99, 1835.

Everard Home, and particularly Blake, has emitted some ideas on the formation of the follicles of the large molars which we cannot permit ourselves to pass in silence. According to their dicta, the follicle of each of these teeth may be regarded in turn as the result of an elongation of the sac which precedes it. Thus, in principle, the membranes of the posterior milk molar and those of the first permanent large molars are intimately united together and continue in the same alveolus; but in proportion as this last is developed, and as the jaws extend, they are placed in a particular alveolus which communicates with the preceding by an opening traversing their common partition. Their capsule then throws out a prolongation for the second large molar; this is formed at first in the alveolus which is common with the first, then they are separated by a bony partition to constitute in its turn, and in the same manner, the sac of the third large molar or wisdom tooth.

This explanation, ingenious as it has seemed to some physiologists, and well as it appears under some circumstances, is nothing more than a pure hypothesis; one must have studied nature with little care to attribute this kind of caprices to her by which she would deviate from the general laws which she has imposed upon herself. While the question as to the origin of the permanent large molars was agitated by Home and Blake, I was seriously occupied in my first works about the germs of all of the teeth and I had then arrived at a safe induction.

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*Bartholomæi Eustachii Tractatus de Dentibus, 1726.

Two essential conditions are attached to the whole dental organism, to wit:—to be, punctually, the seat of a work of production; and to be always in connection with the mucous system. But what are these connections? All authors who have written upon the germs of the teeth, have described them as created and growing in the cavity of the maxillary bones, very near to the gums with some parts of which they are in immediate contact, and with others by the prolongation of their capsules. Well, this opinion, which I entertained for a certain time, I cannot now admit; I nevertheless believe that a most intimate connection exists between the teeth and the tissue of the gum.

I mentioned above that, in following the nervous filament intended for the wisdom tooth in the jaws of young children, I had found a species of swelling formed by the gum at the place where it terminates. Influenced by received ideas and encountering in the body the configuration more peculiar to the ganglions than the characteristics which I had been accustomed to find in the follicles nearly at the period of their first appearance, I hesitated, and, in the doubt, I dared not affirm that I had really found the follicles of the wisdom teeth. However these facts were of too much importance to allow me to rest tranquilly in the doubt; I could neither address myself to the germs of the teeth of first dentition nor to those of the permanent incisors or canines; the parts which should be submitted to these investigations appeared at too early a period of fœtal life, and, moreover, they are so small and so delicate, that I was compelled to run the risk of seeking that which did not exist, or of failing to perceive that which did exist. For these reasons I directed my researches to the second large permanent molars, the follicles of which, as I have said, appear at a period when the jaws are sufficiently large. If we macerate the inferior maxillary bone of a fœtus, or that of a young child just after birth, in an acidulated solution, we may discover the inferior dental nerve about half a millimetre in diameter at the beginning of its canal. This nervous filament takes a retrograde direction; at first from below upward and from the front backward, and afterwards from behind frontward, making the circuit of the internal border of the posterior face of the follicle of the first large permanent molar so as to describe a loop, the concavity of which is turned frontward, the convexity corresponding behind to the ramus of the jaw; from this point the filament joins the gum and very distinctly presents a spheroidal swelling situated at the bottom of, and within, the follicle of the first large permanent molar. If we examine the same parts at a more advanced period of dentition—in the course of the third year—we may remark that the dental cord, which we have described, is larger and separated from the follicle of first permanent large molar by an ossified partition. Its volume sensibly increases as it approaches the gum from which it is separated by a little membraneous cord six millimetres in length, of a lively red color and possessing a marked pulpy consistence. The appearance of this little body announces the work which is going on in the germ contained in the gum and from whence the follicle of the second permanent large molar emerges.

From these facts* I feel justified in concluding that the germs of the teeth primitively exist in a rudimentary state in the gums. They remain stationary until the vital activity, with varied power, animates them to an exertion of their proper functions.

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* Many of these dissections have been made under the eye of one of my respected colleagues, Dr. Hugnier, whose name is familiar to the readers of anatomical works.

Thus, after having proved in 1823, the analogy which exists between the teeth and corns, in respect to the organic acts which concur in their formation and growth, I came to show that the same analogy may be discovered in the primitive situation of the parts charged with the accomplishment of these acts, and that the germs of the teeth, for the mucous system, like bulbs for the cutaneous system, both are an integral part of these organic systems. The demonstration is now complete. But what has guided me? Physiological induction, I should have said were I not afraid of making use of an expression which might seem pretentious.

Surrounded by difficulties, in my first works, this voice conducted me to the truth. I saw that some teeth were only partially covered by enamel whilst others were wholly covered; the development of some was invariably limited; others possessed the faculty of continued reproduction, also other productions of the tegumentary system; I found teeth simple and teeth complex, etc. I was struck by these dissimilarities and contrasts; I observed them but I did not wish, like my predecessors, that they should operate as lines of demarcation separating the teeth from the other phenomena of nature. Far from it; I accepted them as diverse manifestations of the same work. I studied this work and the organs charged with the execution of it and the laws which directed them. From thence all of these exterior forms, all of these combinations, diversification and subsequent complications under which they were hidden, enrolled themselves, simply and naturally, and found their explication as their necessity, in the first arrangement of these organs and in the exercise of the same physiological laws to which they are equally and invariably submitted.

I arrived, without help, at the practice of those principles of a celebrated school of philosophic or comparative anatomy. This school, which the genius of Aristotle had preshadowed, and the route of which was traced out by Vicyd'Azyr, was then listened to with defiance when not with disdain. It was guilty of that fault, so difficult to forgive, of attacking universally received ideas, and, still more unhappily, of encountering as adversaries, the most illustrious and powerful men of science. During the prelude to the struggle which latter it had to sustain, I arose, on my part, against the march followed by comparative anatomy in the general study of the teeth; I showed that it attached itself too exclusively to exterior, secondary characters, and that it did not occupy itself enough with the organ which is the cause of them, and with the anatomical modifications to which it submits; that above all, it had the grave fault of isolating facts and of tracing the separate pictures instead of reuniting them by organic bonds into one and the same system; and in a word, that considered from this point of view it was rather a method of classification than a science, properly speaking. I did more, I laid down the limits which should guide naturalists in the order of distribution of the teeth, and I called their attention to a work on a new subject. Since then several works have appeared on this subject and their authors have not found it necessary to renounce their ancient convictions; I respect them, but I must defend my own.

I now revert to some of the propositions formularized in my preceding memoirs. While they have not been positively assailed, I have nevertheless thought it necessary to develop them to some extent, that they may be the more readily comprehended, and the more scientifically valuable. Besides, another motive engaged me; I, unhappily, found myself in opposition to the opinions contained in a work protected by one of the most celebrated names of our age. In passing these opinions in silence, I should fear to show myself indifferent before the authority which they borrow from the elevated position of their author, or seem to sacrifice the interest of science to personal considerations and repugnance. Thus, in discussing them, am I less happy in being able to render my homage and at the same time in accomplishing a duty?

The questions which I shall examine, relate to the definition and to the divisions of the teeth, and to the characteristics of the roots.

### *A. Definition of the Teeth.*

It would perhaps appear more convenient in a science of observation—in order to proceed methodically—to remit its definitions to the concluding part of the work, as they would thus appear as the necessary consequences of the facts reported—a succinct résumé of the science. By this method, I conceive, they would become less free, for they would be obliged to accord with the facts; but these in their turn, would command a more serious examination, and acquire, in consequence, greater authority.

Thus the teeth having been regarded as bone, they have naturally been defined in accordance with this opinion. The characteristics of bone were supposed to be known, and these were applied to the teeth. They were only distinguished by certain peculiarities accessory to their situation and uses. In this manner, the name of *tooth* conveyed a certain precise, determinate notion, which was far from correct. Some writers, it is true, at different times, emitted doubts as to the osseous nature of the teeth; but these doubts were allowed to remain sterile. Hunter* has the merit of having first established the correct view. His genius advanced beyond the limits which science had reached in assigning their true characteristics to the teeth. Nevertheless, as I have elsewhere remarked, Hunter's theory was incomplete and did not lead to a positive determination of the question. He directed his attention at too late a period to comparative anatomy and experimental physiology, to completely demonstrate what the teeth are; productions of the mucous system resembling all of those which rise from the skin. This consequence of facts, to the attainment of which I have devoted twenty-five years, I arrived at, as the basis of the definition of the teeth, in a memoir read before the Medical Society. I then stated, as a fundamental principle, that an organ should always be defined by its most constant and essential characteristics, and which should be distinctive. In this respect, it would appear that precise definitions are the best introduction to descriptive works, as they facilitate the intelligence in apprehending the subject. The mind is thus enabled to acquire a spirit of generalization in the consideration of gradually unfolding details without embarrassment.

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* *Œuvres Completes*, trans. by Richelot, Paris, 1841, t. 11, 8vo.

Thirty years after, the teeth were defined in one of the most important works on comparative anatomy,* as follows: "mechanical instruments, harder than bone, placed at the entrance of the alimentary canal in vertebrates, for the purpose of seizing, cutting, tearing, crushing or bruising the *nutritive* substances, previous to their transmission from the mouth to the esophagus, or in order to permit of easy deglutition. They also serve some animals as an offensive or defensive weapon."

We certainly cannot accuse this definition of being laconic; but since this has been avoided, have we not a right to ask for some more precise description of what the teeth are, and what place they occupy among the divers systems of our economy. Is it true that, after all the works which have been published on these organs during thirty years, comparative anatomy is content to consider them merely as mechanical instruments harder than bone? Shall we deny the name of teeth to those dental productions which are less hard than bone in certain animals? Do these delinquencies satisfy any anatomical character? By no means. Any physiological character? Still less.

All definitions of the teeth are encumbered by two principal vices; they repose less upon the real nature of these

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*G. Cuvier *Lecons d'Anatomie Comparée*, 2d ed. 1835, note by Duverny, t. iv, 1st part, p. 197.

productions, studied in themselves, than upon the designation of certain respects, true or apparent, of analogy or of difference, with a tissue upon which science has not perhaps yet pronounced definitely; but they are also defective in abstracting the most important part of the tooth; its productive organ; of that which precedes it, and has to do with its future constitution; they exclusively draw from physical or chemical qualities, that is to say, of secondary characteristics, which are of less value in an anatomical determination.

In this these definitions only translate the spirit of the science which has made them. It is necessary to repeat, for comparative anatomy, that the teeth have nearly always been an instrument of classification rather than a subject of physiological investigation; it is this which has caused science to remain uncertain so long in the presence of phenomena which were able to throw light upon it. I know perfectly well that they are not limited to certain exterior signs; that to render these definitions applicable to the teeth, they comprehend the uses which these organs have in different animals; but is this last indication more satisfactory than the first? I think not. How is it that they have failed to give a true signification to the organism, after the part it plays in the functions of our economy? Has not Geoffroy Saint Hilaire always and for a long time insisted upon comprehending in a definition of an organ the functional acts which it is able to accomplish?

The teeth serve most generally for mastication; but are they not of service in any other respect? Do they not vary according to the needs, tastes, and habitudes, and in a certain elevated region in the scale of animals, according to intelligence? For some they are proper instruments for seizing or retaining their prey; for others as defensive or offensive weapons; and to others again, they assist in the articulations of the voice, etc. When we speak of their uses, should we omit the most physiological of all, namely, the tactile faculty they possess, by which they are able to apprehend the physical qualities of bodies submitted to their action? Should we not know that these are the teeth and the rank they occupy in the organism?

The fundamental character of the teeth, that which reposes upon their essential nature, upon the mode following which they form and grow, upon the intimate properties of the parts which constitute them, the character, finally, without which we are unable to conceive of their existence, is, that they are a production of the mucous system. Whence it follows that the composition of these substances, their situation either at the entrance of the digestive tract or more deeply seated, and their use for mastication or any other purpose; all these are of little importance, as accessory traits, as they are but the complement of the principal definition.

It does not become me to judge this definition, but I do not fear to say that it expresses at least a clear and precise idea. The name of *teeth* receives a positive sense, which places them among the productions of the tegumentary system and forever separates them from the osseous tissue. And in this announcement it would be improper to suppose it a purely speculative opinion. This would be gravely misapprehending me. In sciences of observation the truth is fortified by new truths, as error increases by the propagation of error. If we recognize in the teeth certain resemblances to bone, it would be necessary to conglomerate into one body of doctrine all the facts which are attached to the history of these organs, and one would be authorized to generalize and develop from each of them the deductions to which they would conduct. Since then, observation and theory would become common to all of them; science could not advance some without equally promoting others. But if, on the contrary, we admit that the teeth should be assimilated to the other productions of the tegumentary system, all these questions would be found to be transposed to another basis; we should be obliged to renounce the deceptive analogies by clearing them up with new lights which new considerations would suggest; we would search for them in the circumstances where they are manifested, and in the situation in which they would be placed, so that an important discovery could not be made upon one point without benefiting others. Thus, and the researches placed at the head of this work prove it—I have often been able to remove certain difficulites which have occurred to me by this comparative study.

(To be continued.)

# ARTICLE VII.

## *Dental Societies.*

> "And as thus every action, down even to the drawing of a line or utterance of a syllable, is capable of a peculiar dignity in the manner of it, which we sometimes express by saying that it is truly done, (as a line or a tone is true,) so also is it capable of a dignity still higher in the motive of it. For there is no action so slight, nor so mean, but it may be done to a great purpose and ennobled therefore; nor is any purpose so great but that slight actions may help it, and may be so done as to help it much * * * *.—RUSKIN.

IN continuation of some remarks we were permitted to make, on Dental Periodicals, in the last number of the Journal, we propose at present to offer a few reflections on Dental Associations, which we do not think have been so much as hinted at, much less explicitly expressed, in any of the numerous pieces on the subject with which our professional periodicals have been teeming since the late August meetings. These, in order to be the more perfectly intelligible, will be conveyed in the survey we shall take of the work done by those National Dental Societies which have from time to time, been ushered into an ephemeral existence.

We wish to know if these societies have "truly done" and for "a great purpose." If not, it is our hope that these observations may do something at least towards an avoidance in the future, of those apparent abuses to which we shall have occasion to advert. We fear indeed that here, as in the periodicals, our impartial examinations will show nothing more than very insufficient, and we had almost said, contemptible effort. From the beginning their course has been marked by failure, and as far as we know they have only been efficacious in fostering the petty spirit of competition for notoriety. Our search has been rigid through the transactions of twenty years, and during this period, we have been able to discover two circumstances which reflect credit upon them ; the first relates to the pecuniary assistance extended to a periodical which, through its previous existence and influence, had suggested the expediency of their formation ; the second, to the production of some eight or ten tolerably respectable essays which they appear to have elicited.

Here it may be objected that many eminent authorities have disputed the ability of associations to accomplish real benefit for any science, and that ours is not singular in its situation* ; we still persist, however, that societies founded for the advancement of dentistry, have been *particular* in their want of success. They have failed more signally. Their sole result has been to show that the right course is directly opposite to the one heretofore followed.

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* Although anciently *philosopher* and *ascetic* were synonymous expressions—the pagans, however, discovered that "philosophy," when confined to those who secluded themselves from the world, had already become a mask for hypocrisy, as for example, with the pseudo-cynics,*—*now* it is almost universally conceded that the spirit of association is all powerful. The following testimonies bear *for* and *against*.

As *opposed* to the spirit of association, D'Isræli (*Curiosities of Literature*, "Discoveries of Secluded Men," "A Glance at the French Academy," "An English Academy of Literature") and Carlyle ("Signs of the Times,") are the only authorities that occur to us.

But as acknowledging its influence, those we shall mention and quote would appear to settle the question affirmatively. "We owe to France the justice of observing that if England had the advantage of giving birth to the discovery of *universal gravitation*, it is principally to the French geometers, and *to the encouragement held out by the Academy of Sciences*, that we owe the numerous developments of this discovery, and the revolutions which it has produced in astronomy.—*Laplace Systēm du Monde. Quoted by Brewster, Life of Newton.*

"Le principal avantage des Academies est l'esprit philosophique qui doit s'y introduire, et de la se rēpondre dans toute une nation et sur tous les ob

* See Neander, Hist. of the Church, vol. i.

jets. Le savant isolé, peut se livrer sans crainte à l'esprit de système, il n'entend que de loin le contradiction qu'il éprouve. Maisdans une société savante, le choe des opinions systematiques finit bientot pas les détruire et le dessin de se convaincre mutuellement, établit nécessairement entre les membres, la convention de n'admettreque, les resultats de l'observation et du calcul."—*Laplace, quoted by Weld.*

"The development and advancement of science are *signally* indebted to those associations: the Academy del Cimento at Florence, which endured but for a short time; the Royal Society of London, and the Academy of Sciences at Paris." *Weld's Hist. of the Royal Society.*

"The literary institution * * * * * that has been most successful in promoting the interests of science, is that of the Royal Academy of Science of Paris, *where small pensions and great honors* * * * * * have been the means of advancing the mathematical sciences to a state of unexampled prosperity. In England *where such an institution as that just mentioned was wanting*, where the public is perpetually prepared with the question *cui bono*, the same progress has not been made."—*Prof. Playfair. Quoted by Brewster.*

"The spirit of association * * * * * is of native and not of recent growth in England; and among the modern monuments and public works of London, or indeed in the British empire at large, there is scarcely one that is striking or of any magnitude but what has its root in this principle. The British empire in India, the greatest in the world, has grown up in less than a century from a company of traders and capitalists."—*Chevalier Bunsen. Signs of the Times.*

"The only mode of supplying with any certainty this want"—(the point of sight from which the totality of science may be observed and directed)—"is to be sought in the combination of men of science, representing all the specialties and working together for the common object of preserving that unity and presiding over that general direction. This has been to some extent done in many countries by the establishment of academies embracing the whole range of the sciences * * * * * In the absence of such an institution in this country, all lovers of sciences must rejoice at the existence and activity of this Association, which embraces in its sphere of action, if not the whole range of sciences, yet a very large and important section of them.—*Prince Albert's speech before the British Association*, 1859.

"The discovery of new facts in physical science is less effectually promoted by genius than by *co-operation.*"—*Sir W. Hamilton. Epistolæ Obscurorum Virorum.*

"The great modern revival of classical learning resulted in a great degree from the community of ideas—*co-operation* of the scholars of St. Agnes," (A convent in Westphalia.)—*Sir W. Hamilton. Idem.*

This announcement will astonish many, yet we do not make it upon individual authority; we have the "proceedings" before us, which we will now proceed to examine.

"The American Society of Dental Surgeons" met for the first time in New York on the 18th day of August, 1840. The most intelligent dentists in America were either personally present or represented. Some misgivings were felt by many as to the feasibility of the project, yet, on the whole, much unanimity of sentiment prevailed. A constitution, which redounds to the honor of its framers, was offered and adopted. It, paradoxically, but sanguinely announced that the object of the society was the advancement of science by *free communication* among its members and, with such an elevated aim, however encumbered by the condition of "free communication" which practically means "evil communication," the society appeared to be destined to succeed. No less than twelve essays, calling for a vast amount of professional erudition, were allotted to different members. Enthusiasm carried the day. Every one was anxious to work, and so they adjourned. As we shall see this programme, of organizing, appointing work enthusiastically, and adjourning, became the routine of all the societies.

During the following year the interest was kept up by constant notices in the Journal, and when the society met in Philadelphia, no abatement in the general feeling of enthusiasm was discernible; but out of the twelve essays, the subjects of which had been publicly rehearsed at the preceding meeting and printed in large type, not one was read. In their place one was offered on a subject which

Sir Humphrey Davy spoke of the Royal Society as the "*elder brother of Science.*"—*Speech on the Progress and Objects of Science.*

While Carlyle's "Signs of the Times" on the whole, is a vehement denunciation of the spirit of *Mechanism*, (or Association,) it is full of satirical, but forced acknowledgments of its pervading power. These are too numerous, throughout the essay, to permit of more than bare reference, particularly as our note has already reached unwieldy limits.

had not been mentioned but was nevertheless of interest and is at present valuable. There was also an "Opening Address," and a "Dissertation" of two pages on things in general. Ten gentlemen had the satisfaction of receiving appointments to read "dissertations" at the next annual meeting, and the society adjourned. In Boston there was a large attendance. Much general activity was displayed and the list of membership increased; but instead of ten dissertations, science was obliged to put up with the inevitable "Opening Address," *three* essays, relating to the real objects of the society, and an ethical production by the muse of the profession.

At this epoch in our history personal difficulties began to appear in the place of "advancement of science;" but as none of these have yet assumed the importance of Leibnitzio-Newtonian controversy we shall not attempt to elucidate them.

Seven dissertations were appointed for the next year and of that number, besides the address, three or four only were presented. The dismal farce of announcing names and subjects was, as usual, gone through with. The gradual diminution in the number appointed and read continued. Five were allotted for the coming year. One, on salivary calculus was read.

In the meantime local societies were starting into being. As might have been anticipated, they were prolific of opening and closing speeches, of hints oft' told, of quackery, of constitution, amendments and the like; but of true scientific fruit they produced nothing. The parent tree bore all that was to be gathered.

The "American Society" had by this time reached, what we may analogously call, its full vigor and now began rapidly to decline. Although the radical defects of its organization at this period appear in all their deformity it is refreshing to notice that a few devoted men, out of a hundred or so of members, still preserved the best interests of their profession at heart, and did all that was done in the way of study. Their contributions were treated as of little importance, however, as matters of a personal, and hence of a more interesting character, consumed the hours of meeting. The pressure from without became too great and the almost criminally weak barriers as to the qualifications necessary to membership gave way. Persons were indiscriminately admitted and the usual disturbances ensued. Many of those who still preserved their self-respect withdrew, and the society, now unsustained, tottered through two or three years of puerility and died.

Out of the ruins sprang that miracle of republicanism, the American Dental Convention. In pursuance of a call, a large number of dentists met in Philadelphia on the 2nd of August, 1855. Eighty persons signed the hastily prepared articles of association, and as these articles are a wonder in their way, we beg to quote the more striking parts:

"*Preamble.*—At a national convention of dentists assembled in Philadelphia on the 2nd day of August, 1855, for the purpose of consulting upon the measures best adapted *to advance the cause of science*, and *the common interest* and *honor** of the profession, the following plan of organization was adopted:—

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"Art. II. The association is intended to promote professional and personal intercourse among those who are engaged in the cultivation and practice of dentistry throughout the world; *to advance the cause of dental education*, and *systematize* and *strengthen* the *exertions of its friends*, and, by a mutual interchange of opinions and experience to advance the knowledge and liberalize its relations."

"Art. III. The convention shall consist of the members of the convention who shall sign these articles of association, and of such other practitioners of dentistry, and

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* The italics are our own.

*auxiliary branches* of *science** as shall hereafter be elected to membership, and in like manner sign these articles."

What we have quoted contains all that is characteristic in the organization of the convention, and, without the further proof contained in the "proceedings" of every successive year, we think that the practical defeat of the high sounding intentions of the preamble is discernible in the absurdly unwise omission of all reference to necessary qualifications.

That the members of a profession pretending to have some elements of the liberal in it, should solemnly meet together, "pursuant to a call," and enact such laws, by which the most limpid intellect might have foreseen their inevitable destruction by all manner of idle talkers and enterprising speculators, is indeed surprising; and the consequences were not slow in appearing. It must be admitted, however, that the great evil of easy admission was not created by dental societies; other societies have suffered from the same cause, and many of them, including the American Association for the Advancement of Science, have endeavored to abate it by creating two classes of members and by other enactments. But to return—

The first convention, having come into an unhealthy life by a sort of "feet presentation," immediately exhibited remarkable signs of vitality by appointing committees and discussing that mighty subject of filling teeth. A resolution was also passed which recommended the formation of local societies; this profoundedly unoriginal act was the best of the session, but the question as to the expediency of sponge gold, absorbed the almost undivided attention of the learned body. A question which should have been determined by every one at home, by a few weeks experiment, was brought up and kept up to the exclusion of as yet unsettled but deeply important and interesting physiological considerations. Gentlemen gave their "experience," according to article 11, as to the application of a dossel of cotton and the drawing of a file. They made "brief," but it is to be hoped for the intelligence of the profession, unsatisfactory, "remarks" about plaster. They thought well of india rubber, and not unfrequently the ever blooming, perennial theme, alveolar abscess, engaged their valuable thoughts.

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*Those "auxiliary branches of science" are instrument-making, tooth-manufacturing, and material-preparing in general.

Now we do not wish to insinuate that dentists are to be ashamed of gold, for it is by gold that they live; nor would we seek to impugn the valuable properties of cotton; the file is indispensable in the operating room as well as in the laboratory, and plaster is unavoidable. But admitting the value and even dignity of all these things, why should unceasing changes be rung upon their mere names? New properties are not evolved by crying "gold, gold," or "cotton, cotton," on the contrary, we discover a fact which was, maybe, never unknown, namely, that the crier is wanting in a certain property—common sense. Voltaire was very true when he said, "Le sens commun n'est pas si commun." No occult principle has yet been signalized by which a man can make a file more or less than a file by repeating its appelative. Something more must be done if we would add to the truths of science or even present the old ones more clearly. Instead of superficial, one sided experience —which is worse than worthless, as it is pernicious—our meetings should indicate patient study and careful observation. Agassiz says that "though at times a subject may seem to have lost some of its value for being less novel, it generally gains tenfold in scientific importance by being presented in the fullest light of all its natural relations."* The application of this remark has particular reference to the isolated, barren facts which are frequently thrown out at the dentists' meetings.

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* Contributions to the Nat. Hist. of the U. S. Preface, vol. i.

An intelligent person out of the profession, if he thought at all on the subject, would suppose that dentists meet above all to exchange ideas relating to the subjects of their respective studies during the past year; that intelligent person, however, would be immensely mistaken, they meet to re-talk what they talked the year before. Their united wisdom is employed in appointing committees, not in attempting to settle a difficult question. They practice in the parliamentary exercise of passing resolutions, in organizing and in disbanding. They visit various cities and draw down the ridicule of the press by their dismal efforts at pleasantries touching their capacity as eaters.* Let us, however, give all due praise to the discussions of the second convention; here we had decidedly less idle talk than at any meeting of dentists ever held in America. The members entered, with a degree of seriousness, into the study of an interesting question and the meeting was on the whole quite creditable. Several persons presumed to talk about that which they did not adequately comprehend and in place of appropriate and intelligent surmise they threw out experience not at all in point. Still, with these trifling exceptions, the hours of the convention were well spent.

The meeting of 1857 was a feeble imitation of that of the preceding year. Several hints were dropped which might have been made valuable, but the proceedings were, as a whole, lamentably invaluable.

The fourth meeting was without any feature of interest whatever, and the fifth is chiefly noticeable for the good opinion some of the members appeared to entertain of it. One, in the exuberance of his admiration, spoke of the convention as second to none in the world, which was a very high compliment indeed; and the President in his opening remarks, eulogized it for its courtesy and excellent deportment—two features which we had hitherto assumed to be always present when gentlemen meet. He might have commended them with the same propriety, for their personal cleanliness, or for having their hair brushed. He also, with singular infelicity, but doubtless most good naturedly, alluded to the (vinous?) sobriety of the convention and its freedom from other excess. In commenting upon these compliments, the most unpleasant questions might be asked and the answer would be, that, polite and sober as some might be willing to confess, the convocations of the dental convention are never disturbed by annoying inquiries into abstruse questions of science. So much for the convention ; but before dismissing it from our consideration we have a few interrogatories to put, which have direct reference to the implicit and explicit promises of the articles of association :—

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* Witness the transactions at Boston.

Has the convention taken one step to advance dental education?

Has it done anything towards "systematizing and strengthening the exertions of its friends?"

Has it taken any step by which the cause of science may expect to be advanced?

Has the convention maintained the honor of the profession? To all of these there is but one reply—no.

The two dental societies of London, notwithstanding their affirmed instability, claim greater consideration than, for our present purpose, we can bestow. We may, nevertheless, observe that they have assumed a more dignified attitude than could have been expected, from the great social prejudices which are known to exist around them. Without, as yet, having contributed anything of value to science, their transactions are by no means worthless. The volume published by the Odontological Society is handsomely printed and expensively illustrated. Some of the papers are well written, promising much for the future.

The College of Dentists, if we may speak of it as a "society," in our sense, deserves commendation also, for the interesting lectures which we have been able to peruse through its instrumentality.

Thus, after frankly confessing the utter inefficiency of our two great societies, one naturally asks: Does our want of success result from the inherent deficiencies of dentistry or from the faults of organization? We respond that the difficulty is not in the meagreness of dentistry but in unwise organization. The primary objection has been excessive freedom of access, which, of itself, is sufficient to entail all kinds of trouble and eventual dissolution. Most of the learned societies of Europe have taken great precautions in the admission of members, and we strongly insist, that some measures of the same kind are necessary in dental societies. To be sure, they are not likely to rival those European institutions in distinction, yet, they as imperatively demand similar barriers to the incursions of the "great unwashed." Notwithstanding the flattering remarks of members of the convention, it cannot be taken for granted that all dentists, or indeed all members of any profession, are prepared for admission into every assemblage.

Having assumed that this evil of freedom of access needs only to be stated to be duly appreciated—having the history of societies before us—the next point is, how shall the evil be avoided? It would be ridiculous to apply the test of scientific reputation or proficiency, and we have only the tests of morals and money left for our present needs. The importance of manners and morals will no doubt receive due consideration, as heretofore, in future "opening addresses," we will, therefore, proceed to the more tangible subject; but without going articulately into a discussion of the details of a model organization, it is certain that our chief evil may be greatly mitigated by the money test. There can be no doubt that considerable fees will keep out a large class of persons who are not of the least use and who, under the present order of things, are exceedingly troublesome. There is another class, unfortunately, as much to be dreaded; it consists of those who are willing to make large outlays in the gratification of vanity, who *must* be known as participants in every movement. The five or ten minutes rule is the only check we can think of to be applied here. They penetrate everywhere, and if we cannot absolutely prevent we can at least use palliatives. Besides keeping out the troublesome, the treasury will be filled and this is indispensable, under any circumstances, for the accomplishment of the objects of association.

The following table will indicate the custom of the principal British societies in regard to fees. Most, if not all, of these are metropolitan and possess fixed places of meeting, together with libraries and museums; still the sums which they spend in the acquisition of this property should be used, by a national association of dentists, for purposes equally, if not more, desirable. It should bestow the money it would spend, if fixed, in a library and museum, in prizes and in the support of scientific investigation. The value of our table, therefore, is not impaired by the difference of circumstance between the societies we shall refer to and a dental association on new principles. Money is as necessary in perambulatory as in fixed societies.*

| | | Admission Fee. | Per Annum. |
|---|---|---|---|
| The Royal Society, | | $50 00 | $20 00 |
| The Geological Society, | non-residents, | 50 00 | |
| | residents, | 30 00 | 15 00 |
| The Linnæan Society, | | 30 00 | 15 00 |
| The Royal Med. and Chirurgical Society, | | 30 00 | 15 00 |
| The Zoölogical Society, | | 25 00 | 15 00 |
| The Royal Society of Literature, | | 15 00 | 10 00 |
| The Royal Astronomical Society, | | 10 00 | 10 00 |

The practice of these eminent bodies, in connection with the testimony of our own unhappy experience, is such that we consider the propriety of large fees as affirmatively settled. Except under peculiar circumstances, as, for instance, when there are grades of membership, a grade for work and two or three grades of members who facilitate operations by supplying funds, we cannot conceive of any advantage accruing from small fees. Genuine lovers of truth, philosophers, will rarely withhold their co-operation on account of an increased tax. Their devotion is not great in proportion to the smallness of the costs. At first view it may be supposed that poor men suffer by this arrangement, for the good of the majority; but, upon reflection, it will appear that they will be benefited, their service being always rewarded if of value.

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*The British Association for the Advancement of Science, a perambulatory society, has spent in round numbers, $85,000, (£17,000,) in the accomplishment of scientific objects.

Supposing then that a large fee has been determined upon, what shall the dentists do in conclave assembled? Our idea is that their workings should be modeled, with certain modifications, after those great representative societies we have alluded to. A careful study of their history and rules will enable us to anticipate most of the difficulties to be apprehended, and with this basis of knowledge for our operations, we may then add such distinctive features as the profession requires.

The utmost liberality should be displayed in giving prizes. It must be remembered that many, who would devote themselves to scientific pursuits, even for a limited period in the investigation of suddenly suggested subjects, are deterred by pecuniary difficulties. Books, apparatus, materials of every description are expensive, and without a prospective return in some shape, they must of necessity keep at their "bread and butter science." Moreover, prizes stimulate those who would otherwise make no exertion. But it is useless to recapitulate the advantages of prizes. The example of the greatest institutions all over the world must be familiar to all.*

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*The following particulars, relating to the prizes in the gift of the Royal Society, are illustrative of our subject; possibly they may be of use:

In 1736 Sir Godfrey Copley's donation was converted into a gold medal of the value of five pounds, bearing the arms of the society, as Weld the historiographer of the society remarks: "This medal, the most honorable in the

The student then should be encouraged by emoluments and honors, to re-examine old truths with greater attention and to follow out new speculations undismayed by possible loss. Physiology, microscopical and comparative anato-

power of the society to bestow, (termed by Sir Humphrey Davy the ancient olive-crown of the Royal Society,) has been awarded for upwards of a hundred years to the authors of brilliant discoveries; and there is hardly a name eminent in science that does not appear as the recipient of this honorable testimonial of appreciated merit."

In 1796 Count Rumford gave five thousand dollars, the interest of which was to be given in the shape of two medals—one of gold, the other of silver—"as a premium to the author of the most important discovery or useful improvement on Heat, or on Light."

In 1825 the king founded two gold medals of the value of two hundred and fifty dollars each, which are now bestowed under the following conditions: That the royal medals be given for such papers *only* as have been presented to the Royal Society, and inserted in their transactions.

That the triennial cycle of subjects be:

1. Astronomy; *Physiology.*
2. Physics; Geology, or Mineralogy.
3. Mathematics; *Chemistry.*

In 1825 Dr. Wallaston established the *Donation Fund* by giving $10,000 to the society, the dividends of which are applied to the promotion of experimental researches, &c., in rewarding those by whom such may have been made." Mr. Gilbert contributed $5,000 in addition to this fund and Mr. Hatchett $500. In 1848 the fund was raised to the sum of $25,000.

In 1839 the celebrated Bridgewater gift of $40,000 was made for purposes which are so well known that they need not now be enumerated. Subsequent gifts have doubtless been made but, if ever aware of them, we cannot now recall them to mind.

Since writing the above the grants of the British Association, for 1859, have been announced in *the Athenæum:* the following is a list of the investigators chosen, the topics they are to treat, and the sums of money they are to receive towards the expenses:—to the Kew Observatory, 500*l.*,—to Prof. Sullivan, "Solubility of Salts," 30*l.*,— to Prof. Voelcker, "Constituents of Manures," 25*l.*,—to Mr. A. Gage, "Chemico-Mechanical Analysis of Rocks," 25*l.*,—to Dr. A. Smith, "Scientific Evidences in Courts of Law," 10*l.*,—to R. Mallet, "Earthquake Waves," 25*l.*,—to Rev. Dr. Anderson, "Excavations in Yellow Sandstone of Dura-Den," 20*l.*,—to Sir R. J. Murchison, "Fossils in Upper Silurian Rocks Lesmahoge," 15*l.*,—to R. M. Andrews, "General Dredging," 50*l.*,—to Dr. Ogilvie, "Dredging North and East Coasts of Scotland," 25*l.*,—to Prof. Kinahan, "Dredging in Dublin Bay," 15*l.*,—to Dr. Daubeny, "Growth of Plants," 10*l.*,—to Prof. Allman, "Report on Hydroid Zoophytes," 10*l.*,—to Dr. Wilson, "Colour Blindness," 10*l.*,—to Admiral Moorsom, "Steam-Vessels Performance," 150*l.*,—and to Prof. J. Thompson, "Discharge of Water," 10*l.*;—making altogether a total of 930*l.*

my, chemistry and pathology, in reference to dental science and operative and mechanical dentistry, should be standing subjects for prize theses.* Most valuable results would inevitably follow.

Care should be taken, above all, to avoid that common error of magnifying the importance of mere handicraft dexterity. For,as those branches of professional knowledge are pursued which require the higher faculties of the mind for their development, so will dentistry be entitled to a place among the liberal professions. The observance of this truth, the violation of which has heretofore justly caused the dentist to be looked upon as a mere craftsman, deeply concerns all future advancement. It should be ever borne in mind.

From the foregoing it is plain that our reform consists, *first,* in so constituting any national society of dentists that, if possible, only the meritorious be admitted. This may be done by requiring every candidate to be recommended by at least three members and the votes of two-thirds of those present as necessary to election ; furthermore, an admission fee of the largest reasonable amount—say of from fifteen to twenty-five dollars—and a proportionably large yearly payment.

*Secondly,* we would accept the teachings of universal experience and stimulate industry to the utmost by founding prizes for discoveries, inventions, and thesis. And the invitation to competition should not be confined to the members of the society or the profession. But these prizes should not be conferred lightly. Unquestionable merit,

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*It has occurred to us that dentists might apply themselves, with the greatest profit, to the *morphology of the teeth.* It is possible, as the teeth have so marked a relation to the necessities of the animal, that their more hidden peculiarities, particularly in the human species, may indicate most interesting psychological modifications. This has been suggested by some remarks made by Agassiz, upon the importance of studying the habits of animals, (contributions, p. 57—63, vol. 1,) and by the valuable results of the comparatively recent sciences *vegetable and animal morphology.*

to be determined by rigid examination, alone should entitle to honor.

And *thirdly*, as we conceive that dentistry can only advance as it cultivates science, the highest honors should be bestowed on those branches of study which are scientifically important but only very *indirectly* valuable in *practice;* these are Physiology, Microscopical and Comparative Anatomy, Chemistry, etc.

Thus the real wants of the profession would be measurably supplied.

## ARTICLE VIII.

### *Letter from Dr. Harvey.*

Buffalo, Nov. 14th, 1859.

Dr. Harris:

*Dear Sir*—An article published in the November number, of the Dental Cosmos, on the subject of arresting excessive hemorrhage, sometimes following the extraction of teeth, has stimulated me to communicate to you for publication, should you deem it of sufficient interest to your readers, the following method of arresting the kind of hemorrhage spoken of.

Some twenty years ago, by accident, I hit or blundered upon a process that can never fail, if properly performed, no matter how profusely the blood may flow. I have no doubt you will think that I have been derelict in duty, in not publishing this before. The charge is acceded to, and the only reason, be that good or bad, that can be given, is a lazy constitutional repugnance, in writing upon any subject. The material used in plugging the socket or sockets, is simply lint, made from old or new black silk cloth. The silk being placed upon the knee, is scraped with a case knife, until a sufficient quantity is obtained.

Nut galls, alum and sulphate of iron, are the articles used in dying black silk. This lint, so strongly impregnated with these powerful astringents, forms with the blood, in its passage into the socket, a sure and certain compound, for a mechanical stoppage of the hemorrhage. The mode of introducing the lint is very simple. Take a sufficient quantity to fill the socket or sockets, up nearly even with the margin of the gum, lay the lint over the sockets you intend to plug. Take a good strong plugger, that will enable you to carry the lint down to within an eighth, or quarter of an inch of the apex of the socket. Introduce the lint continously, and in quite large quantities. Pack with force enough to make it quite solid. Now let the patient rinse the mouth, that you may ascertain if the bleeding is arrested. If not, use more pressure, and it may be necessary to force more lint by the side of that already there. This plug must be allowed to come away of itself, which will be in five or six days. More reliance is placed upon obtaining a firm plug than upon the astringent qualities of the silk. The dyes of the silk seem to render it capable of adhering together, and of remaining in its place.

Yours, truly,

C. H. HARVEY.

# BIBLIOGRAPHICAL NOTICE.

## ARTICLE IX.

*On the Mode of Formation of Shells of Animals, of Bone, and of several other structures, by a process of Molecular Coalescence, demonstrable in certain artificially formed products.* By George Rainey, M. R. C. S., Churchill, London.

Mr. Rainey is already well known to the European profession as one of the most persevering and industrious contributors to the various scientific reviews, and also to the Microscopical Journal, &c. A great variety of subjects are treated of in the work before us, which have of course been described or suggested by others. The author remarks: "As the facts and views to which I allude are for the most part of a general character, and of *dubious* authority, I have thought it better to refrain from mentioning *names* in connexion with them."

If we mistake not, Mr. Rainey successfully combated the strange theory of Mr. Tomes, and others of his school, of the so-called dentinal tubes. The author claims, firstly, a process by which carbonate of lime can be made to assume a globular form, and the explanation of the nature of the process, "Molecular Coalescence," by which the form is produced. Secondly, the explanation of the probable cause of crystallization, and the manner in which the rectilinear form of crystals is effected. Thirdly, the discovery of a process of "molecular disintegration" of the globules of carbonate of lime by inverting the mechanical conditions upon which their previous globular form had depended. Fourthly, the recognition in animal tissues of forms of earthy matter analogous to those produced artificially. And fifthly, the deduction from the above fact, and considerations of the dependence of the rounded forms of organized bodies on physical and not on vital agencies.

"After explaining the process of coalescence, molecular disintegration, the structure of crab-shell, bone, &c., we arrive at that portion of the work which is most interesting and instructive to the dental profession, the dental tubes, &c. The author here remarks upon this subject, "Dr. Carpenter observes, that 'the calcareous layer of the crab-shell is composed of a substance exactly analogous to ivory, being very transparent, and apparently homogeneous, when cut into very thin slices, and being perforated by an immense number of minute sinuous tubuli, which run nearly parallel to one another, from one surface of the shell to the other. This arrangement may be seen by making a thin section of any part of the shell; but it may be shown particularly well in the end of the claw, which is thicker and of denser texture than the rest. A transverse section of this shows the tubes radiating from the central cavity towards the external surface, and would, I feel assured, be regarded by the most experienced observer as the section of a tooth if he were not informed of its real nature.' The resemblance between dentine and crab-shell, as observed by Dr. Carpenter, is in most respects correct and sufficiently striking to justify the inference that they are formed in a similar manner. This, I believe, is the general opinion of physiologists. The globular particles of carbonate of lime in shell are doubtless analogous to the globular dentine in teeth, and the apparent spaces between the radiating lines in the former correspond in a great measure to the so-called dentinal tubes in the latter. But respecting the fact of these being, in either case, tubes, the results of my experience and investigations are opposed to this view. It is evident to me from the plate xv, fig. 14, in the descriptive catalogue of the Royal College of Surgeons, that if the tubes there represented are intended to show a form of structure analogous to dentinal canals as they are generally termed, the author has made a great mistake, I may observe, that in the end of the crab's claw, as seen by the microscope, there are, as in other parts, the two different kinds of structure just described, one consisting of alternate dark and light generally sinuous lines, extending from the superficial towards the deep surface of the shell generally considered to be tubular. These lines exist in every part of the shell sufficiently thick to present them and in certain positions, as in the end of the claws, their course gives them very much the appearance of dentine. However, I may repeat the observation, that, in the claw, especially of the very young animal, they degenerate into mere dots before they arrive at the cavity of the claw and present nothing in their appearance of a tubular character. The cause of this arrangement of the particles of the shell has been explained, and there can be little doubt but that this same explanation applies to the spaces existing between the longitudinal portions of dentine. These latter spaces are in principle analogous to the canaliculi of bone, which will be fully explained in the article on bone. Hence, in one form of bone the cementum or crusta petrosa, canaliculi and dentinal canals sometimes exist together. The dentinal canals are merely spaces of feeble or imperfect cohesion continued from the interglobular spaces where such exist between longitudinal portions of coalesced dentine to the pulp cavity. These passages becoming a little widened from the contraction of the part in drying and containing air, seem to have, under the microscope, especially if appearances depending upon distance are not sufficiently allowed for the appearance of tubes. It is, however incompatible with the function of tubes, as they exist in other parts, that a system of such organs intended for the conveyance of secreted fluids should be simple prolongations of the interstices of the body as are the spaces between globular portions of dentine and the pulp-cavity of a tooth, this latter, notwithstanding its size, being only a cellular interval. The other structure is distinctly tubular. It does not exist excepting in the tegumentary part of the shell, and it is, which is most unquestionably represented in the plate before referred to. These tubes pass from the external surface of the shell, through its substance to its deep one."

The preceding extract from the work clearly shows the opinion of the author as bearing on Mr. Tomes' theory upon the subject of "dentinal tubes." The dental profession will feel much indebted to the author of this little work for clearing away the cobwebs of a false theory—and we trust ere long this valuable contribution to science will find a place in every dental library on this side of the Atlantic.

## ARTICLE X.

### *Reproduction of a Canine Tooth, at thirty-nine years of age.*

MESSRS EDITORS:

I have just seen a remarkable case of reproduction in the mouth of a lady wearing a set of ten upper teeth, on gold plate. Some fifteen months ago, in preparing her mouth, I had considerable difficulty in removing the eye tooth root on the right side, it being so decayed as to repeatedly break under the operation. To the end of the fang was attached a large ulcer. Some six months after, when the patient came to have the impression taken, she complained of a "sore lump," that had appeared where the eye tooth root had been removed. On examination, sure enough, there was a protuberance of similar form and texture, as that caused by a tooth, endeavoring to break through its fleshy covering. But as the patient had passed the years of childhood, and arrived at that age when new teeth are scarce, unless supplied by the dentist, the idea of cutting a new tooth where one had but a short time before been removed, never entered the head of operator or patient. The lump was supposed to originate from some irritation in eating. The impression was taken, the teeth inserted, and not until this morning, more than a year after, was anything heard of the patient, who would not have called at this time if it "had not been for the breaking" of a tooth which she wished replaced. While speaking of the plate, she remarked, that it was very loose, and did not fit her mouth, as when made, which she thought was owing to a new tooth she was cutting. I laughed at the idea, of a woman of 40 years old, getting a new tooth, but on examining the mouth, sure enough, where I had such difficulty in removing the old tooth, and where the lump had been, was the enameled surface of what appeared to be another; instead of the cutting edge projecting, as in the usual way, the anterior surface of the crown presented itself parallel with the gum, occupying the place of the lateral incisor. After much persuasion, I removed a perfectly formed canine tooth, and of the usual size. The lady departed, expressing herself very grateful that the "pesky" thing was out of the way, believing that she should after this be "*cuter*" than ever, having cut her eye teeth the third time.

Yours,
G. F. J. COLBURN, D. D. S.

NEWARK, N. J., *Nov.* 1*st,* 1859.

# SELECTED ARTICLES.

## ARTICLE XI.

### *Necrosis of the Lower Jaw from fumes of Phosphorus. Much attention has been recently attracted to this disease, of which we subjoin the reports of cases from different sources.*

FORTUNATELY for us, in this country we do not see so many of the terrible effects arising from the employment of phosphorus in lucifer-match making as are witnessed in France and Germany, where such manufactures are most extensively carried on. Necrosis of the lower jaw is, perhaps the only special result which comes under the notice of the English surgeon, and which does not appear until the teeth first become affected. Diseases of the lungs, in consequence of the manufacture, are with us almost unknown: whilst in Paris and elsewhere many of the workwomen have to leave their employment from what were looked upon as *neglected colds*, terminating in consumption, but which were, in reality, the result of the inhalation of an atmosphere, which Dr. Dupasquier found to consist principally of hypophosphoric acid, probably mixed with small quantities of phosphuretted hydrogen, and possibly the phosphorus itself in the form of vapor. The breath of these people at night becomes luminous. The valuable Report of Dr. Waller Lewis, presented to both Houses of Parliament in 1855, "On the regulation of Noxious Trades and Occupations in France," very clearly shows that bronchitis, often in a very severe form, is a common affection amongst many of the workpeople, and, in proof of this, he furnished abundant evidence from various sources, as well as from personal observation.

Now, although in this country we are free from the worst chases of the disease, it still behoves manufacturers to consider whether, in place of phosphorus, some other chemical substance could not be introduced which would produce the igniting effect desired, without the sickening and unpleasant alliceous odor which invariably arises from this element. Such matches are now being manufactured in Paris by M. Canouil. Amongst other varieties, they are made of chlorate of potass, powdered flint or glass, bichromate of potass, gum or dextrin and water, made into paste. A simple friction produces combustion ; there is no unpleasant smell, because there is no phosphorus, and, what is of considerable importance, their manufacture is not injurious to the workpeople. Much misery and suffering are therefore obviated amongst those who are employed in the factories.

In a former "Mirror," when placing upon record an instance of necrosis of the lower jaw, arising from the fumes of phosphorus, in which Mr. Thomas Wakley removed the bone with success at the Royal Free Hospital, we devoted some attention to the consideration of this subject, and we urged the propriety of the periodical examination of the teeth of those employed in the factories where it was used, so that the spread of its destructive influences might be arrested. We referred to several other cases which had appeared in our "Mirror ;" but Mr. Wakley's was one of the most remarkable we had seen. The patient has since given up his old employment.

Besides necrosis of the jaw and diseases of the lungs, which arise from phosphoric vapors, it has been ascertained by M. Moignot that the women employed in the manufacture of lucifer-matches are very liable to miscarry, and so fully aware have the workmen become of this peculiarity that advantage has been taken of it to procure abortion.

In the case which we now record, the disease did not appear until the gums in contact with the diseased teeth became ulcerated, which produced pain and swelling of the jaw, with ultimate complete death of the entire bone. It is somewhat remarkable, that one condyle, together with the coronoid processes of the rami, should have been withdrawn entire, particularly when we consider the important muscles which are attached to the latter. The phosphoric infiltration remains in the soft structures of the cheeks, thus giving the patient an artificial appearance of health.

Charles T——, aged thirty-nine, a wax-taper dipper, was admitted into the above hospital on the 28th of December, 1858. About thirteen months ago, he complained of much pain and swelling about his lower jaw, commencing in one of the right incisor teeth. Abscesses formed and burst externally through the skin of the cheek. When admitted, his face generally was much swollen, exhibiting the peculiar pasty appearance witnessed in necrosis of the jaw arising from the fumes of phosphorus. Several fistulæ were noticed at the lower margins of the jaw, communicating with dead bone, and giving passage to matter. On opening the mouth, the lower jaw was seen exposed denuded of periosteum, and quite black in color; it was also slightly movable. He had been working for seventeen years at his calling before the ulceration of his gums commenced.

On the 9th of April, chloroform was given by Dr. Martin, and, when anæsthesia was complete, Mr. Coote proceeded to saw through the symphisis of the lower jaw within the mouth; after which, by the aid of a pair of forceps, the left half of the lower jaw was drawn out entire, without its condyle, but with the ascending ramus. The same proceeding was adopted with the right half of the jaw, which came away with equal facility, but with the condyle, which appeared to be healthy. Some hemorrhage necessarily ensued, but it was not great, and spontaneously ceased. For some three or four days after the operation, the patient complained of pain in the face, but it gradually diminished and soon ceased entirely. His health now began to improve, under the use of a liberal diet; his appetite increased, and his strength returned. The investing periosteum of the old bone now began to throw out fresh osseous material, and a new lower jaw was in the process of formation, as has been noticed in other and similar instances.

The pasty appearance of the face, and the puffiness of the cheeks, however, remain and these would seem to be almost the permanent consequences of the affection. He left the hospital a short time back, completely restored in health, and able to speak and articulate with tolerable distinctness.

On examining the bone when cleaned and dried, we found it to be massive, and of nearly double the weight of the healthy bone. It was covered in some places with unhealthy lymph, undergoing osseous transformation.

Ten years ago, there was a patient in this hospital, under Mr. Stanley's care, who was a fellow-workman in the same factory, and whose lower jaw was affected with necrosis arising from the same cause.—*Lancet.*

## ARTICLE XII.

### *Phosphor-Necrosis.*

Dr. Markoe presented two specimens removed from the same patient, illustrating phosphor-necrosis of the jaw, a disease which was now attracting a great deal of attention, and the pathological anatomy of which differed in a considerable number of points from that of necrosis, occurring under ordinary circumstances. While under other circumstances necrosis produces suppuration on the outside, the separation of the dead bone and the formation of an involucrum, here a totally different circumstance occurs. Instead of the separation of a sequestrum, we find the surrounding parts secreting bone immediately around the dead portion. The dead bone becomes incrusted with pumice-stone-like material, which adheres very firmly to the bone, so much so that it can hardly be separated from it. These two specimens illustrate very beautifully this variety of disease. They were taken from a man who labored in a match factory. He had a tooth extracted, and at that point the mischief commenced. At the end of five months he was subjected to an operation, and a portion of the jaw removed. The wound healed up, and shortly afterward he went back to the factory. The disease then attacked the other side of the jaw, and this was removed, and also a portion of the upper jaw.

The unfortunate feature of these cases is, that this pumice-stone exudation represents a reparative attempt, or rather it represents what would be accomplished, if the dead bone were taken away. In that case the periosteum would secrete new bone, which would replace the old bone. But when this pumice-stone exudation takes place, there is no reproduction of the bone. In this case, it is now eighteen months since the operation, and there is no formation of new bone tissue. The upper jaw appeared to be simply necrosed. There was none of this exudation, or at least so little, that it was not noticed.

The patient is doing well, and although both halves of the lower jaw and one side of the upper jaw have been removed, his face is very shapely.

Dr. Sayer inquired whether the rule was a general one, that in these cases of removal of the jaw for phosphor-necrosis, no attempts at new bony formation took place afterward. He thought quite the contrary was the case, and remarked that Dr. Wood, who had perhaps more experience on this subject than any other man in this country, in one case removed both upper jaws, when the bones grew in again, and the patient had placed upon them a set of artificial teeth. He would defy any one to detect that the jaws had been removed in that patient, so complete was the deception. He hoped that Dr. Wood would favor the society with some remarks on this subject.

Dr. Wood did not desire the society to go into a discussion of this matter now. He would, however, on some future evening, bring some beautiful specimens, showing perfect reparation in cases where the bone had been destroyed by phosphorus. He would suggest that Drs. Markoe and Parker also bring their specimens, and then the society could go into a general discussion of the subject.

[*Report Proc's N Y. Path'l Soc. in Med. & Surg. Rep.*

## ARTICLE XIII.

### *Treatment of the Asphyxia caused by Chloroform.*

Messrs. Editors:

I noticed in a late number of the Philadelphia *Medical and Surgical Reporter*, the statement that Langenbeck, of Berlin, successfully performed the operation of tracheotomy for asphyxia and apparent death from chloroform; hence the following:

During the past winter, I have had occasion to perform a number of experiments upon animals—cats and dogs principally. To reduce the animals to a state of get-at-ableness, and to prevent interruption to my operations, I have generally administered chloroform; but, to produce complete anæsthesia, particularly in a cat, necessitates very large doses; and I often found that, when I had arrested all the voluntary motions of the animal, the effect was made permanent by the stoppage of the involuntary motions. I observed, too, when the animal lay upon its back, while under the full influence of anæsthetics, that the respiration was often stopped, or else impeded; and when it lay upon its breast, with the mouth turned downward, this did not happen. I could find no explanation for this, except upon the supposition that the tongue fell backward from its natural position, in such a manner as to close the air-passages leading to the lungs, thus preventing the entrance of air into the organs of respiration. I have never noticed this, while the animal possessed any voluntary motion, or power sufficient to hold the tongue in its normal position during respiration. Often, too, when an animal stopped breathing, respiration was immediately resumed, if not too long stopped, by drawing the tongue forward with forceps, partly out of the mouth, and sometimes resorting to artificial respiration. Since the learning of this fact, when performing experiments upon such subjects, I have always confined the tongue partly out of the mouth, and by so doing my animals always live, unless they die from causes extraneous to the results of anæsthesia. I think, if due attention is given to these facts, that most, if not all, of the animals which die by anæsthetic cause, during experiments, may be saved; which is a great desideratum, in the neighborhood of an experimenter or a medical college, where numerous experiments render it difficult to obtain them.

Now, was tracheotomy necessary in the case in which Langenbeck operated? I think not, and its success adds to the truth of this assertion. If he had drawn the tongue forward, partly out of the mouth of his patient, I think the result would have been the same. What other explanation for the success of the operation can be given? I am not aware that pseudo-membrane, or other obstruction, is developed in the air-passages by the administration of anæsthetics. The obstruction must have been between the mouth and cricoid cartilage, and, without doubt, that obstruction was the tongue.

Generally, patients undergoing any operation, from the extraction of a tooth to the amputation of a limb, while under the influence of anæsthetics, are either placed horizontally upon the back or in a reclining position, so that if the patient lose all muscular power, the tongue would naturally fall downward and backward—thus preventing the passage of air, which requires but little change in the position of the tongue. It is not often that we hear of the death of a patient, while possessing any voluntary power.

I think one reason why ether is less fatal than chloroform, is that the anæsthetic effect of ether is not often pushed to the extent to which chloroform is given, ether being less powerful in effect than chloroform.

I am surprised at the want of knowledge in the medical profession upon these simple facts; and I am satisfied that many of the deaths of persons thus asphyxiated by anæsthetics, might have been prevented by a knowledge and application of them. CYRUS B. SMITH.

[*Boston Med. and Surg. Jour.*

## ARTICLE XIV.

*On Dental Decay.* By FRANCIS H. THOMSON, M. D., Glasgow.

FEW questions are more frequently put to the practitioner than those pertaining to dental caries, and it is to be regretted that but a fractional portion of those, in the department devoted to the practice of dental surgery, are able to give satisfactory answers. This is caused partly from the conflicting theories of Hunter, Fox, Bell, and other contemporaneous writers, or from ignorance; this latter reason, however greatly to be deplored, is much the case amongst the dentists of this and other countries.

The above mentioned writers all concur in the view that caries almost always, if not invariably, proceeds from some undefined inflammation arising in the interior of these organs, and that, therefore, all caries is developed from within, and gradually comes to the surface. Facts bear us out in thinking the very reverse to be the case. Caries, or gangrene, seems to be an improper term to apply to disease in the teeth, as under every circumstance the destruction of these organs is produced, not from any suppurative process, but merely from the abstraction of the phosphates and carbonates, by the change which takes place in the saliva from alkalinity to acidity, in various diseases and states of the constitution; it will, therefore, perhaps, be necessary that the composition of the teeth be noted, as laid down by Berzelius, Rhetzius of Stockholm, Purkinje, Müller, Owen, and many others, in the course of their physiological investigations.

The teeth are composed of enamel, bone, dentine, and a substance which has received various names, such as cortical, crusta petrosa, and denominated cement by Owen. The enamel is almost entirely composed of phosphate and carbonate of lime, with a light proportion of organic matter.

ENAMEL contains:

| | |
|---|---|
| Phosphate of lime, with fluoride of calcium, | 88.5 |
| Carbonate of lime, . . . | 8.0 |
| Phosphate of magnesia, . . | 1 5 |
| Membrane, alkali, and water, . . | 2.0 |

The osseous portion, or dentine, hardly differs from true bone. Berzelius found therein:

DENTINE:

| | |
|---|---|
| Cartilage and vessels, . . . | 28.0 |
| Phosphate of lime, with fluoride of calcium, | 64.3 |
| Corbonate of lime, . . . | 5.3 |
| Phosphate of magnesia, . . | 1.0 |
| Soda, with chloride of sodium, . | 1.1 |

In the cortical was found:

| | |
|---|---|
| Organic matter, . . . | 42.18 |
| Phosphate of lime, . . . | 53.84 |
| Carbonate of lime, . . . | 3.98 |

Thus showing that enamel is almost entirely destitute of organic matter.

The cortical has even more organic matter than the dentine. It may thus be seen that writers on dental caries have every reason to suppose that disease may be similar in its origin to caries in the bones, seeing that in some kinds of dental caries the result appears to be much the same. But any one in the habit of examining diseased teeth, may observe that the alkaline portions are always abstracted, whereas, in true caries, it is the organized matter which is lost; and although there may be exception to this regulation, yet, in most cases of caries, the process has been the result of inflammation causing suppuration.

The result of experience tends to show that dental caries is produced by mechanical causes and external influences;

and if such be the case, the reason must be evident why the alkaline portions are always abstracted and the vascular or organized left.

It may be necessary to change the term caries to decay, or simple death of the part, and as all subdivisions should be avoided, decay may be classed under two heads—

### SIMPLE AND COMPOUND.

Before going into what is the proximate cause of decay, it may be as well to touch on the most commonly accepted theories promulgated by the writers above named.

"The proximate cause of caries," writes Mr. Fox, "appears to be an inflammation in the bone of the crown of the tooth, which, on account of its peculiar structure, terminates in mortification. The membrane which is contained within the cavity of a tooth is very vascular, and possesses a high degree of nervous sensibility, and inflammation of the membrane is liable to be occasioned by any excitement which produces irregular action; and as the bone of the tooth is very dense, and has little living power a death of some part of it may speedily follow inflammation of the vessels of the membrane which is contained within the cavity. When this membrane becomes inflamed, it separates from the bone, and the death of the tooth is the consequence."*

Mr. Bell differs from Fox, in so far that he makes out the proximate cause of caries to be an inflammation of the external surface of the bone immediately under the enamel. He writes—"The true proximate cause of caries or gangrene is inflammation, and the following seems to me to be the manner in which it takes place:—When from cold, or any other cause, a tooth becomes inflamed, the part which suffers most severely is unable, from its possessing comparatively a small degree of vital power, to recover rom the effects of inflammation, and mortification of the part is the consequence."

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* Fox, Nat. Hist. of Teeth, part ii, page 12.

Mr. Hunter has come nearer to the true cause, as, although he says that caries is a disease arising originally within the tooth itself, he evidently had a strong opinion that the different articles containing strong menstrua had an effect in assisting caries. Although he held this opinion, it is evident his theory went no further than the possibility of transitory damage caused by the passage of acid food over the surface of the teeth in its way to the stomach; and on experimenting, he found this action to be so slight that he concludes by leaving the subject in the same state, viz. that caries has its origin in the interior of the teeth.

The teeth, being furnished with a lining membrane, and all of them possessed of the same bony structure, should, according to these views, be all subject to the same symptoms, and no class, therefore, should be more frequently the seat of decay than another; yet it is a fact, admitted by these authors, that this is not the case, for all speak of external and internal, superficial, lateral, deep seated, and many other subdivisions of decay. Mr. Fox says, that the molars are more subject to caries than the other teeth; that the incisors of the upper jaw are often affected, but those of the under seldom or never. But were the different arguments used upon this subject to be discussed here, the object of this paper would be departed from—which is to give a short explanation of what appears to the writer to be the true cause of decay.

To elucidate the views adopted, it will be necessary to trace to its true source that morbid process by which the teeth are gradually and insidiously destroyed, and it may be as well to speak of simple decay as the first division of the subject.

Simple decay is that which is found in the molars principally, showing itself on the crowns where the enamel meets, from its points of deposition, four in the under and five in the upper, and discoverable at first by a crucial formation of dark lines—the first indication of the decay visible to the eye.

It may be necessary slightly to speak of the peculiar mode of development observed by nature in the formation of the teeth, differing as they do from the other *bones* of the frame.

Each tooth is derived from a separate pulp, observable as early as the fourth month of gestation. These pulps are highly vascular, having an investing membrane, also supplied with its complement of nerves, veins and arteries. These pulps derive their vessels from the artery which passes along the jaw, and the membranes directly from the gums. The bone of the tooth is formed from the pulp, and the enamel from the investing membrane. The osseous matter is deposited on the extreme points of the pulps from the vessels. In the incisors it begins upon the edges, and in the molars upon the points of the grinding surfaces. These ossific depositions soon extend over the surface, till the whole pulp is invested. The enamel secreted from the investing membrane is deposited on these ossific points, in the shape of a fluid that is at first of the consistence of cream, passing into a chalky substance, soon, however, becoming hard, and seeming to undergo a process of crystallization, for it takes a regular and peculiar form. When fractured, it appears to be composed of a number of small fibres, all of which are arranged to pass from the center to the circumference of each point of deposition. As the fetal formation proceeds, new particles are evolved, gradually enlarging each circle of radiation, till all meet in the center of the grinding surface of the tooth. In the healthy organization becoming agglomerated, and forming a strong covering to the more delicate bone structure below, and much less liable to decomposition. But should the development be interfered with in the fœtus by the casual disturbance of the circulation during the period of gestation, it is invariably seen that the vigor necessary for the healthy exhibition of the bone and enamel, is wanting. Thus generally, from an unhealthy pregnancy, the teeth are found to be imperfect. This may not be observed in childhood, as no great note is taken of the first teeth, but, in the permanent teeth, decay is invariably developed at some period, and generally before puberty, when from the unconfirmed substance of the teeth, and imperfect junction of the enamel plates, acid evolved in different complaints, produced by a delicate organization, and in after life superinduced by an artificial mode of existence, attacks the bone through the imperfect joining of the plates. In such states of constitution, the saliva is more or less acid, and although these acids, found in excess in unhealthy, are also to be discovered in normal saliva, experiment has ascertained that they are destructive to the bone of the tooth. Much acid may also be evolved by the food indulged in, and, although not the primary cause of decay, in all probability much increases the carrying out the destruction of these organs. The saliva, according to M. Donné, is in its normal state purely alkaline, and this conclusion is now followed by most physiologists. The pathological condition of the stomach, induced by an acid state of the saliva, is irritation of the mucous membrane; and he contends that this condition usually induces or is accompanied by acidity of the saliva. Besides giving the result of his experiments in arriving at these conclusions, he has narrated a number of cases illustrative of the corresponding change from acidity to alkalinity as the patient recovered from disease.

It may be proper to give the results of some experiments which have been carried out with regard to the action of acid agents on the teeth, and it will not be difficult to show that in various diseases these same acids are evolved.

*First,* Both animal and vegetable acids act on the bone and enamel of the teeth.

*Second,* Alkalies do not act on the enamel.

*Third,* Salts, whose acids have a stronger affinity for the lime of the teeth than for the bases with which they are combined, are decomposed, the acids acting on the teeth.

*Fourth,* Vegetable substances have no effect upon the teeth till after fermentation takes place, but all of them capable of acetic fermentation act readily after the acid is formed.

*Fifth*, Animal substances act very slowly, and even in a state of putridity are tardy in their action.

*Sixth*, Acetic acid so corroded the enamel of a tooth which was placed in it, that in twenty-four hours all that remained could be easily scraped off with the nail. Citric, mallic, muriatic, sulphuric, and nitric acids soon decompose the teeth (and yet how often are those exhibited in medicine without any precaution being used !)

Having thus mentioned the different acids which have effect on the teeth, it will be easy to show that many of them are evolved in certain diseases impregnating the saliva, and thence acting on the teeth.

Simon, in that part of his learned work on animal chemistry, devoted to the investigation of morbid secretions, says, that "the saliva becomes affected in different morbid conditions of the system, but the nature of the changes that it undergoes has not been hitherto sufficiently studied. Morbid saliva sometimes contains a free acid. This is most commonly lactic, but in some cases acetic is also present. The acid reaction may at once be detected by test paper. While normal saliva communicates a blue tint to red litmus paper, this, on the contrary, reddens blue paper. I have frequently," he continues, "seen the saliva acid in acute rheumatism, and in cases of salivation."

According to M Donné, the saliva has an acid reaction in all cases of irritation and inflammation of the stomach, in pleuritis, encephalites, intermittent fevers, acute rheumatism, uterine affections, and amenorrhœa. Brugnatilli detected oxalic acid in the saliva of a phthisical patient. The secretion of saliva is sometimes increased to an extraordinary degree, constituting salivation. In such cases the chemical characteristics of the saliva are more or less affected. He detected true acetic acid in the saliva of a patient who had just terminated a course of mercury. The saliva was very viscid, of a yellow color, and possessed of a sickly disagreeable smell. The results of his experiments decidedly prove, that in almost every case where he tested morbid saliva, some acid was found, each more or less having an agency in the decomposition of the teeth. His experiments on morbid gastric juice are most interesting, but too elaborate to be more than hinted at in this paper. He says the increased acidity of the gastric juice usually arises from an excess of those acids which exist in a normal state, viz. muriatic, acetic, and lactic acids. When there is a tendency to the formation of an excess of acid in the gastric juice, it appears to be developed from the food—muriatic principally from animal, acetic and lactic from vegetable, especially such saccharine food as bread, beer, and wine, and the fatty acids from an excessive use of fatty matters. Excessive acidity is frequently observed in scrofula, rickets, associated with disease of the spleen, also in gout and nettle-rash.

Having thus given a slight account of the different acids evolved in the saliva and gastric juice when in a morbid state, and having also asserted that decay of the teeth usually, if not always, is found as the result, it may safely be inferred that the saliva so constituted is a most active agent in their destruction. First it is found that, from a delicate gestation, diseased pulps are exhibited, consequently irregular action in the deposition of the bone and enamel; and, as much delicacy and irritation is usually in such cases evinced after birth, causing a morbid state of the secretions, thus laying the foundation of decay, and interfering with the proper development of the teeth, yet this may be so far arrested by the adoption of peculiar treatment and diet. Although decay of the first teeth may not be very evident till near the time of changing, and not much taken into account, yet the action of the different secretions is even more powerful in them than in the permanent teeth; and minute investigation of the molars, the first of which in the second set appear above the gum about the seventh year, will distinctly show the irregularities of the deposition of the enamel before described; and the slightest attack to which children of that age are always more or less liable, such as scarlatina, measles, &c., by producing peculiarly acid states of the saliva and gastric juice, will much increase the process of decay, not very easily accounted for in many cases, and doubtless observed by all practitioners. This decay may be defined as that which is observable on the crowns of the molars, and that insiduous decomposition which takes place so often at the junction of the enamel and bone portion of the tooth where the gum begins.

Although these views of simple decay may not be entirely original, seeing that various authors have slightly alluded to the effect discernible from the action of the different acids on the bone and enamel, no one has described this as the proximate cause of decay, for all talk of internal inflammation of some kind or another being the cause. Inflammation may be the result, but certainly never the cause of decay, for it must be a practically ascertained fact, that pain never exists in a decayed tooth till the nerve becomes inflamed. Now, if this inflammatory action showed itself before the appearance of decay, severe pain would be the result. This, according to the experience of patient and practitioner, never does take place, and toothache proper is only felt when, from the pressure of the decayed mass upon the nerve and vessels in the interior, disturbance ensues. It cannot be denied that much pain is often felt in the interior of the tooth when no decay is visible, but arising from a totally different cause. When, from cold, sudden shock, or constitutional change, inflammation is produced in the interior of the tooth, the result is not visible decay, but suppuration of the nerve itself, which is relieved by exudation through the fangs, causing gumboil and all its attendant miseries. Gumboil also is often the result of a decayed tooth, but this is when, either from injudicious stopping, or from the pressure and non-removal of decayed matter, the discharge resulting from inflammation cannot evacuate itself into the decayed cavity. As a result of this internal inflammation, various well-known complaints arise in the mouth, such as exostosis, anchylosis, and caries of the sockets.

The second class of decay may be named compound, and is that which is found between all the teeth, but more especially in the incisors and bicuspids, and denominated lateral decay, by many writers. It appears at first as a mere point, gradually increasing till absolute decomposition ensues. It is in treating this part of the subject that a distinct knowledge of the vascularity of the teeth becomes of such importance in the elucidation of a correct diagnosis of this disease. Compound decay would appear to derive its origin from stoppage of the circulation, caused by too close contact of the teeth; for no isolated tooth is ever primarily attacked, or teeth where the enamel has become developed before contact. Some may say the enamel is not vascular, and therefore no damage can take place from contact; but lateral decay never does show itself, except where, from deficiency of the enamel, the bone of the tooth is exposed or very imperfectly covered, and the tooth in contact with its neighbor. In tracing this class of decay, it should be borne in mind, that, in nine cases out of ten, compound decay is developed before puberty, when the teeth are very highly organized, and consequently more likely to suffer from any stoppage of the circulation.

Compound decay may take place at any age, but this is caused by the action of morbid saliva carrying on what may have commenced in infancy, arrested by a strong and healthy boyhood, and again becoming developed by an attack of fever, consumption, or even salivation. The object in making use of the term compound is, that after the morbid condition of the teeth, caused by impeded circulation, has taken place, it may be much increased by the action of the saliva and gastric juice in their morbid states. Hunter observed, that, when caries is communicated by contact, it probably is caused by the action of some acrimonious discharge from the decaying tooth, which, in the first place, occasions a decomposition of enamel, and afterwards of the organs themselves; but there is this peculiar difference, that in the one, decay proceeds from the interior to the exterior, whilst the other commences on the surface. What is there in this to lead one to the true cause? He has, on the one hand, left the proximate cause of true decay much in doubt, and, on the other, only hinted at the action of some discharge, the specific nature of which he does not define. It must be well known to all versant with this subject, that no discharge ever does appear but such as is produced by inflammation going into suppuration, and his theory is rendered still more fallacious by his assertion, that decay must be instituted before any discharge can take place.

From the preceding remarks it must be obvious, that all those who practice dental surgery ought to be acquainted with every department of medical science. A mere mechanical practitioner can never, in the long run, be useful. The more the medical and surgical knowledge of the dentist, the more will he be enabled to alleviate pain or suffering; and the better a man is acquainted with the whole of the healing art, the more successfully will he devote himself to any department to which he may direct his energies. Hitherto, with few exceptions, this branch has been the refuge of those who could succeed in no other, or, what is worse, has much fallen into the hands of uneducated or partially educated adventurers, who, having acquired a few of the manipulations and some knowledge of the mechanical part, have, by bold effrontery and unscrupulous statements, imposed on the unthinking portion of the public. As knowledge advances, the less will be the success of the uneducated and designing; and all who may be, each in his own department, lending a hand to put down quackery in all its branches, are diffusing such a knowledge of natural phenomena, that men, knowing and obeying the Creator's laws, will enjoy the best health, mental and physical, consistent with our present imperfect state of existence. [*Glasgow Med. Jour.*

## ARTICLE XV.

### *Metropolitan School of Dental Science.*

THIS School was inaugurated on Wednesday, October 5th, in the presence of a large number of the medical and dental profession.

Dr. Richardson, the professor of anatomy and physiology, at the request of his colleagues, delivered the inaugural address, which was listened to with marked attention.

We subjoin a verbatim copy.

### INAUGURAL ADDRESS.

GENTLEMEN.—We have met to-day, to open in formal manner a school for the advancement of the science and art of Dentistry. The undertaking is novel in a double sense. The school is new, and the school is the first of its kind in this kingdom. The history-books tell us of our forefathers, "that cut off by sea from the rest of the world, they became mariners at first from necessity." It may be, in the future, said of the modern dentists, that cut off by custom from the rest of the scientific world, they made scholars at first from necessity; and I trust it will be added in continuance of the argument, that what originally seemed an inconvenience, turned out in the end so much to their advantage that they are acknowledged by all persons to be the undisputed lords of the science ocean.

Were I, in the remarks I have to make, to follow entirely the bent of my own inclinations, I should try to beguile the hour by addressing myself as a teacher to those exclusively whom we hope to see taking permanent possession of these benches; not as listeners to a discourse so transitory as this, and spoken at a time when a warm enthusiam prevails; but as calm, hard-working disciples, determined on one point, that nothing which the dominie knows, and is willing to tell, shall be unlearned. I should like, I say, to make this subject-matter apply especially to these; to point out to them, in so far as my ability may permit, the mental elements required in the course of philosophical labor, the methods of inquiry, the worth of the study, and the rewards and the happiness resultant.

But inasmuch as I have come here with yet another intention before me, as I stand, for the moment, the representative of those who have projected this school, it is incumbent on me in the first instance to describe, in simple and practical terms, the principles upon which the school is founded, and the character of the teaching which is here to be carried out.

The first intention, then, is to elevate the dental profession, by affording the facilities for a liberal professional education, by asserting, without assumption, the independency of the profession, and by aiming at the establishment of an entire unity, either now or hereafter, amongst its divided brotherhood.

Until within these last few years, dentistry as a particular calling has had no recognition, except if the expression is allowable, in that individualism which has marked it out as a practical science and art, followed by special men since the remote period when Herodotus himself met its practitioners in the Egyptian cities. All else has congregated itself, and claimed recognition; the priest has his order, the barrister his temple, the physician his college, and the merchant his guild. The dentist, isolated by his pursuits as much as the rest, his nothing.

But these last few years have wrought a great change here as abroad. America has now her dental institutions in abundance—the continent its schools—while, in England, where the organization has been last to commence, and commencing has met with unusual, unexpected, and I am right when I say, *unnecessary* difficulties, it has progressed so quickly withal as to have led to the establishment of a college, and of a learned society kindred to others of older growth. These institutions, each alike important in their respective spheres, are by their very existence clear indications of an association of ideas, if not at once of men. But such institutions, though by nature primary and pre-eminent, in that the manhood and full intellectual capacity of the section they represent is embodied in them, are not complete without a third, viz. one that shall give the ready means for the acquirement of knowledge to the junior or less advanced members of the professional body. An institution that shall induct these into their proper places in the older establishments, to supply as each generation passes to its inevitable rest, another, and another, and another, each one more perfect in knowledge, and reflecting a degree of respect and information equal to the taste, the refinement, and the intelligence of the age. I have now explained the meaning, present and remote, of the Metropolitan School of Dental Science.

To make their exertions the more useful and accessible, the founders of this school have endeavored to take not only a liberal, by what is considered by all men freed from the bias of corporate interest, an advanced position in educational concerns. Guided by the experience, and forewarned by the errors of past educational schemes, they have cast to the winds all fancies about restrictions, preliminaries, curriculums, and prison-like enactments. Believing not only the anatomical truth, that every man has a brain, but the physiological fact also, that every brain is impressionable under sound and useful tuition, they open their doors to every respectable youth or man who, with the self-respect natural to a gentleman, will listen to their teachings. But enforcement there is none. The teacher will lecture under no hard system—the student will learn in liberty. Who is there that wishes not the knowledge for its own sake, and for the certain advantages following its possession? He has no invite here. Or, as the great

English Protector said to his never-beaten volunteers:—

> "I pray consider it. Do I come to tell you that I would tie you to this war? No. But if you can come to prosecute it, prosecute it vigorously, or don't do it at all. I think it my duty to deal plainly; therefore this is what I advise you—that we join together to prosecute it vigorously."

Nor can it be feared, so long as no intermeddling statecraft intervenes, that success is not to follow such liberal enjoyment of educational pursuits. The history of the past, in its triumphs and in its errors, tells us in fact that education is never so ennobled as when it is free, and never so degraded as when it is fettered. The history of medical education is pregnant of this truth. I turn to the time when corporate greed and intolerance laid no hand on medical knowledge, and there are the schools worthy of the name, and there are the teachers of immortal celebrity, and there are the students who rival the masters. I see the school at Padua, and Fabizzio teaching the traveling Englishman the elements of the circulation. I see the school of William Hunter, and William teaching to unrestrainable brother John the rudiments of the classification of the living and the dead creation. In the same free school I see again the said John Hunter instructing the earnest Jenner in that method of research which was afterward to guide him to the great practical discovery of vaccination.

From this I turn to the modern school, with its divided, and divided, and divided schedules,—upon which mere compressed ragstuff all the unity of science is broken—with its three-year formulas, and its shepherd porters counting in the flock to listen unwittingly. And what is the effect of the contrast? Gazing at the one the true lover of science feels a glow, an energy, a soul-lighted enthusiasm, which lifts him, like sweet sounds or the beauty of a sunsetting skyscape, almost out of this little life. Turning to the other the whole dead attraction of earth draws him towards its centre, and so binds him hand and foot, as by magnetic cold, that it were relief to sleep from the picture, though the sleep were jeopardous.

The founders of the present school, as men of the world knowing the limitations of their project, make no pretension to rival the great schools above named. But if not in fame, they would at least, if it were possible, imitate them in that freedom which has so often nursed fame; and thus striving would leave their endeavors to the consideration of all common-sense men, convinced that they who know most of education as an artistic effort will be the last to criticise.

The plan of instruction instituted in this school next calls for a word of description. It may be that in progress of time the practice of teaching will indicate some modifications or improvements. After the most careful consideration, however, of the requirements of the present day, the faculty of lecturers feel that their design may be considered as accordant with the principles upon which the school is founded, and with its scope as an educational centre for members of a section of the community engaged in a special pursuit.

It has been urged repeatedly that for the necessities of one engaged in the pure practice of dentistry, there are actually required, in addition to a good general education, competent knowledge of but three scientific branches, viz. *anatomy, dental surgery* and *pathology* and *dental mechanics.* Grounded well in these three departments, and made directly conversant with them in practice, a dentist, it is argued, possesses all that particular information which the practice of his daily life and the welfare of the public demands.

In this argument there is an undoubted practical force and logic of no mean distinction. That is to say, there is a relationship between pure dentistry and medicine which is best maintained in amity, and with mutual advantage, by such friendly difference in the practical parts of each as shall prevent encroachment on either side, and the jealousy that might follow on such encroachment. In a word, it is felt that the present excellent understanding which obtains between the two professions, and by which they are and always will be equally benefited, is due to the distinctions of practice and of qualification.

In marking out the educational system of the "Metropolitan School of Dental Science," all the strength of this argument has been admitted, and it has been arranged that the three above named departments of science shall stand as the basis of the educational plan.

At the same time a more extended idea of the scientific endowments of the dental profession has been taken. It is assumed that the practitioner in dentistry, engaged in a pursuit that fills up his working hours in special scientific labor, is in a position, without any trespass on other practical pursuits, to devote a learned leisure to the pursuance of those higher branches of science which, unconnected mainly with the bread-earning duties, raise man above the drudgeries of life, and proclaim in demonstrative terms that in his full attributes—derived from a contemplation of the higher branches of natural knowledge—each man partakes of that divinity which once everywhere and even now in barbarous nations is allowed only to enshrine the person of the king. It is assumed that the dental profession has the means, as the will, to pursue in quiet moments these greater problems of the universe ; and it is believed, as indeed it has been shown, that the members of this profession are never themselves so elevated, or their profession through them, as when they take a prominent position in these nobler studies, or sit, as one of them (Professor Bell) now most honorably does, in presidential rule over the followers of a philosophical sect. With these feelings, then, the scope of the school has been enlarged beyond the mere necessaries. There are added to it three distinct studies, which will give the Attic salt to the edibles, will render labor more pleasant, and will open the intelligent mind to thoughts and acts which the longest lifetime enjoys but too briefly. And this leads me to enter in some detail into the subjects which are really to be taught.

We take *anatomy* then, as the first and basic subject, and in so far as time will permit, we shall make every effort to give to this department its due importance. Practical instruction must here of necessity be the secret of success to the teacher, and practical learning for the taught. The student will find in this pursuit the simplest and most satisfactory part of his studies. In this all is straightforward sailing. The acceptance into the volume of the brain of natural records, freed from speculation, and acquired with mathematical precision.

To this anatomy we add *physiology*, or that science that gives vitality to the dead record. Which says of this bone, this muscle, this nerve, in their living time these parts did such and such duties. Without this sister science anatomy were disgusting in its details, and comparatively useless in its results. With it the heaviness of death is past, and the mind, receiving glimpses of those living actions which concern us most intimately, sees open to it a new world of thought, more expansive than is supplied by the mere material universe in its widest representations.

It is wonderful, overpoweringly wonderful, to go with the astronomer in his wanderings. To see him gauge the infinite; to observe him, with the genius of Leverrier, step in mental calculation out of the extremest known range of this system of planetary worlds, and add thereto another world, which has never before been seen, but appears as at his bidding. To see him next hiding himself for a season in the glory of the sun, return and say that between the radiant luminary and the first known planet of the system there exists yet another,

> "Lost in the near effulgence of his blaze."

But what of this in its wonder to the still greater wonder which is opened to the philosopher of life? To him who shall read the physiological laws truly; who shall master the dead matter the dissector maps out; to whom shall be revealed the nature of that living force and principle by which the greatest of material problems are wrought out, by which the mind in mastering those problems performs its functions to that end, by which the hand which perpetuates the labor does its task in obedience to the mind?

When, then, we include in our scheme the science of life, we offer to the student the richest branch of natural study open to his intelligence. A work in which he can not only *do* and follow, but *do* and *lead*. A work which, but little understood by the public, claims pupils by the million. A work to the which every simple, well-known thing, every insect, every flower, every man, offers a problem.

To give another and more practical meaning to anatomy and physiology, we shall blend with it, incidentally, a third subject, *pathology*, or the study of disease. It will be obvious that in this direction our attention must be confined chiefly to the pathology of the organs of mastication; but enough will also be supplied to guide the learner to a knowledge of the general and more useful principles of this science.

The second division of our educational scheme is entitled *dental surgery*. In this department the teacher will ask attention to those practical daily duties upon which the science, as a science, mainly rests. There will here be introduced the history of surgical manipulations on the dental organs; the symptoms, course, and results of dental disease. The effects of various agencies, constitutional and local, in the production of such disease. The influence in their turn of these diseases on the body at various periods of life, and an account of those measures, remedial, or preventive, or both, which the most advanced experience shows to be of the greatest service in treatment.

The third subject in our design is *dental mechanics*, or that art, for here dentistry takes in an art of the most simple and beautiful type, which shows how nature may be supplemented, and I say it with all deference to the worthy dame, in some cases surpassed; and again how natural parts may by sundry scrapings and stoppings be restored and preserved. There has been, and if I am not erring still is, an attempt made now and then to ignore this department of dentistry, because it is mechanical. I have never, however, for my part met with any dentist or surgeon-dentist who so far forgot himself, in ignoring it, as to forget the receipts of certain advantages derived from it in the shape of such specimens of fine metals as it delights the masters of Her Majesty's mint to stamp right royally, or of such relics of crisp paper as the little old woman in Threadneedle street chooses to shape into billet-doux for her admiring favorites.

Anyway the founders of the new school have no such scruples, and being themselves (such of them as can practice the art) rather accustomed to find it an essential; and being further assured that he who cannot practice it, or at least superintend it, is but half way towards good or successful practice, they have felt it a duty to make this subject a basic one for the student; and that it may be taught thoroughly have arranged to have it taught entirely by demonstration.

It has been further agreed to institute a chair in this school, from which will be taught the *elements*, or rather the *principles*, of *surgery*. It is not to be expected, nor is it intended that the lecturer will here, in the short course to which he is confined, enter at length, or in detail, into surgical science. But he will be enabled to carry out, nevertheless, a very important intention. He will lay down such instruction and practice as will give the industrious man an insight into the higher practical branches of surgical skill, and will make, as the learned Caphagus has it, "the rudimans" so clear that no difficulties shall stand in the way of him who may choose to apply—after observation and reading, to the mastery of the science in its full breadth and usefulness.

The introduction of a chair of *chemistry* into an educational establishment of this kind carries with it a practical, as well as a philosophical meaning. In the scientific family chemistry is the industrious sister, who never gets married, who has always more work of her own than she can do, and who is withal inexhaustible in the assistance she can render to the members of her circle, from brothers and sisters direct to nephews and nieces of all generations.

It matters little where, in the history of the world, we pick up this science, whether we trace it back to Tubal Cain, *malleator et faber;* to the Egyptian Hermes and his magical expositors, known equally to Moses or Democritus; to *the* chemist—*i. e.*, alchemist, and his transmutations of vile metals into gold; to Paracelsus, with his immortality-giving draught; to his rhapsodic followers, the Rosicrucians; to Agricola, seeking wisely to turn chemistry to application in things of common life; to Berner and Becher, systematising the whole crude form into philosophy; or to Mahow and Stahl, penciling out the chemistry of living things: to whichsoever origin, I say, we trace back the science, we find it exerting an influence century by century, year by year, month by month, and now week by week increasing, until at length it has infused itself into all that we know and most that we do. But of late years this pervading science has certainly taken advance in no one direction more rapidly and more advantageously than in that into which it was first turned by the far-famed Agricola—I mean its application to the daily wants and arts of life. To chemistry in this sense the eye of every man is turned. For this the northern artisan, with dye-stained hand, stipulates with his employer for one hour a day, that he may listen to his chemical professor. For this the Prince of Wales, and hope of England, leaves the realm of royalty to learn the secrets that have made his coun try so great and himself, through his country, so important in the eyes of all the world. Under various unnecessary names, such as metallurgy and technology, the science has thus been carried into new shades and grades. But, under whatever names, these, in an elementary sense, all mean, chemistry in its practical application to the wants of man.

Now, in regard to dentistry, chemistry comes in with all her force, use, and friendliness. She tells the dentist, and she will tell him much more if he will only listen to her, what metals will best mould themselves to his will; what amalgams in respect of color, durability, and harmlessness, will answer his purposes best, and what materials will supply the most convenient substitutes for natural parts which have succumbed to disease. Nor, in relation to dentistry, does she stop here. In the knowledge she supplies as to the effects of external agents on organized structures, and of animal secretions on animal textures, she suggests much as to the first causes of natural disease, and the means by which such natural disease may be either prevented or cured. Lastly, it is the office of chemistry to teach the elementary nature of things, organic as well as inorganic. To show of what parts each living structure is composed—tooth and bone, nerve and muscle; to indicate the method in which these parts range themselves into compounds and structures, and to compare arrangements in healthy and diseased states. In these respects, therefore, she assists materially the understanding in its appreciation of the laws of physiology or pathology, in their unity and in their combination.

If I have endeavored thus to render the good science-sister a good turn, with some warmth of commendation, I have but done so on the principle that "one good turn deserves another;" for to me she has rendered much, and, by that sympathy which binds men of scientific taste in one bond, I feel that in offering the privileges of a chemical education, however short to the industrious student in dentistry, there is held out to him, both in poetry and practice, a pursuit which, followed out honestly, gives a daily recompense.

In the design of the school one last, but not least, object is brought into view. We have thought it desirable to introduce comparative anatomy into the plan. We have a reason for this, and a valid one. I have already stated that it is our intention not only to supply the necessaries, but to supply such further knowledge as shall form a nucleus for pure science, to which the wearied man may turn and feel in his relievement a mental occupation, and therewith a novelty, a pleasure, and a treasure. Now, there is a curious psychological fact as regards professions; they, like men, exhibit individually their special tendencies to particular tastes and pleasures, towards which, either by habit or nature, they turn as it were irresistibly, and sometimes show a genius which would not otherwise have been brought out. With regard to dentistry and its representatives, this disposition is seen leaning to natural history. I do not mean to flatter and say that the pursuit of natural history is as yet intimately allied with dentistry, but I say that the tendency to such alliance is very clearly marked in all parts of the world where dentistry is practiced; for, not only have many dentists, such as Nasmyth, George, and Bell, shone in this department of natural science, but the greatest comparative anatomist or natural historian of his day, John Hunter, contributed largely to dentistry, and seemed, out of the range of his philosophical thoughts, to hold the study of the teeth in the first rank as a practical pursuit.

Seeing, then, this natural tendency, we have determined to encourage it in our efforts, to suggest, in an outline of this science, the taste for its better acquaintance, to supply the principles, and, in regard to the comparative anatomy of the structures, which more particularly concern the practitioners adduced, to supply the details in their richness.

Did it belong to me to hold the pen of St. Pierre, that so watching with him through his microscope the architecture of an insect city, built on a mere strawberry leaf, I could, from the height of the greatness of man above insect, depict what I can only borrow, the outline of that microcosm; the city with its naturally constituted rafters of gold, pillars of ivory, and arches set with ruby and topaz; its cups, urns, pavilions, and domes, which human architect and goldsmith have not rivalled. Could I depict, in continuance of the brilliant history, the beings that live under a reflex thus enriched to whose perception through their compound eyes a drop of dew filtering in a capillary transparent tube is as a thousand cascades; or could I, leaving this tiny natural world, carry you with the force of Cuvier or Humboldt to the description of that leviathan which those who go down to the sea in ships see and wonder at; could I describe his habits and home, I might be expected, nay I might, from the two extremes of great and little, and their connecting links, sketch out in graphic force a picture at which the imagination should faint, first to behold and then to comprehend. To me this knowledge, this power belongs not. I can but offer to the student such childish thought for his ambition as invests a midsummer dream when something is said or suggested, for which more is waited, and which afterwards, undefined and undefinable, excites yet to desire and hope—the desire, the hope of some realization as substantial as it is unknown, and which, having neither shape, nor color, nor form, is nevertheless felt to be radiant with beauty.

It will be the congenial, the delightful task of one of my colleagues to lead the student through the range of truth above shadowed forth, nor, despite the tenth great precept, can I envy him less in his labors than admire him for the ability and industry by which those labors are sure to be rewarded.

But when I have pointed out the indirect value of the natural history pursuits, I have scarcely given to them even fair commendation, or their just weight. In them is embodied something also of the direct and the practical. By them comparative pathology is introduced. By them the structure of animal tissues and their application to the uses of man are made apparent. By them the analogies between man and his lower earthmates are established.

I have thus placed forward the intentions, in so far as I can represent them, of the founders of this school. It has been so long the custom, in considering the question of professional schools, to connect with them the idea of an infinitude of departments, that the staff of teachers may at first sight seem capable of increase. We hope, however, to make it obvious in practice, that limitation of subjects instead of proving an inconvenience, by obliging us to group analogous studies round a common centre, and to reduce the actual amount of personal attendance on the part of the student will cause the unities of natural science to be more clearly depicted, and labor to be conserved. If there has arisen one doubt on these points, it refers to the subject of *materia medica*, as a department in itself distinct. It has been intimated to the faculty of lecturers, that as there are certain remedial agents used in dentistry —in the way of lotions, balsams, stoppings, and the like— it had been well to make this a particular study. The suggestion, after having undergone careful consideration, has not been adopted. The faculty has concluded, that all reference to such remedial measures belongs naturally to the lecturer on dental surgery, who will therefore make it a special part of his course.

I have spoken in so far on matters pertaining to the Metropolitan School of Dental Science, as a separate institution it is incumbent on me, however, to allude to two other facts, which extraneous in themselves, have nevertheless a bearing on the success of the school as an educational enterprise.

Firstly, then, in order that the students here educated may have the advantage of clinical instruction under teachers, some of whom are also teachers in the school, the dental practice of the Westminster Dispensary has been rendered, by new and excellent arrangements, subservient to practical education. Here the student for a small fee may enter to a special course of learning, and may supplement the school studies by daily observation and personal experience.

In the second place, the College of Dentists, by a recent change in its laws, has established an examination for membership. With sound discretion, the college authorities have enforced no curriculum of study. But as their examination requires knowledge, and knowledge which must be obtained, the opening of a school at the present moment stands in the free-trade relation of supply to demand.

And here the opportunity is most fitting for an acknowledgment, on the part of the faculty of lecturers, of the kind interest and valuable assistance rendered to the faculty by the council of the college. Not only have the members of the council exerted themselves individually for the success of the school, but in their united and official capacities they have granted an efficient aid, without which the school itself had scarcely been established—or at least not without an excessive outlay of labor and of pecuniary means.

When I state that excellent accommodation for lecture purposes has been allowed to the faculty at a mere nominal rent; and that three valuable prizes (one of them named in honor of the founder of the college the Rymer prize) have been offered as rewards to those students who shall most distinguish themselves in industry and proficiency, I have said sufficient to indicate the liberality of the council of the college, and its earnestness in the cause of professional education.

In return it has been a source of equal pleasure to the faculty to offer to the college members such advantages for attendance on the lectures as shall afford a partial but grateful compensation to so much considerate care and friendly assistance; both the more acceptable because devoid of pretence and strictly in season.

From the history of the school and its intention, I pass now from a general to a particular topic—to the selection of a few phrases addressed purely to the student, his labors and his prospects.

I need not repeat what has been said as to the conditions under which the student life may be commenced in this place, nor as to the class of students for whom the instruction is intended. I shall assume at once that my words reach only the ears of the industrious and well-meaning, so that in the way of direction and encouragement there will be required no line from me as to moral conduct or example in life. I want, indeed, only to speak of the way to work, and of the rewards which are offered for work well done.

The primary principle, then, I would lay down as necessary to success is *reliance*. Reliance not so much in teachers and books as in the inner self, as in the power of the individual mind to doing and conquering. The student resting on his own strength for action, and on the strength of others more advanced for the supply of knowledge, is already more than half-way on his road to position and honor. In suggesting this reliance, understand that I do not mean by it conceit. Conceit is not reliance on self, but want of reliance in every thing that is not self. Conceit is therefore, in truth, a real want of self-reliance; since man is so constituted that his own faith, however great, must, to be applied, be linked to a certain degree, with the faith that is in others.

No! I mean by self-reliance such simple trust in industry, in thought, in natural capacity, as shall enable the student to feel that he can work as others work, learn as others learn, and succeed as the best. Or, to put the principle in another light, I mean a negation of doubt, the parent at once of idleness and of failure. The poet has indeed well instructed us when he says—

> "Our doubts are traitors,
> And make us lose the good we oft might win,
> By fearing to attempt."

And the prose poet Bunyan, when he puts his hero into Doubting Castle, expresses with another intention the same truth. Therefore I commend you to steer clear of doubt in the acquirement of knowledge, for by this you will obtain the first great secret of learning—simple trust in self and in learning itself.

But the negation of doubt, or in other words, the appreciation of faith as to your own powers, must, to be kept in order, be kept in work, and must be based on the constant and repeated observation of the natural phenomena which it may be your duty to investigate. This thought leads me to the naming of another faculty of mind as an essential one to be cultivated. I will call it *solidity*, as the best synonym for a long definition.

Now solidity is obtainable in study by this preliminary process, a determination at first to learn all facts and no opinions. In natural studies the possibility of this resolve is easy, because the natural laws and ordinances, in so far at all events as we can comprehend them, are uniform and stable; or so nearly so that trifling aberrations in details serve only to imprint more firmly on the mind the elementary truth. You, therefore, setting forth in your pursuits with a certainty of precise knowledge before you, may, without the least fear, throw your whole energies into your labor, with the conviction pre-eminent that by constant and close attention to each fact, and by repetition and repetition, you must learn and learn well. Leave you this system in your early days, and the smoothness of your course is lost. The apparent true will melt into the absolute false, and the laughing world will drive even hope out of your hearts.

When the great Columbus set out from Palos to sail into an unknown sea, his companions not appreciating the primary facts on which the faith of their commander was founded, saw ever and anon in the horizon island upon island ; they defined the shores, counted the mountains, shaped the bays, and even traced the rivers. These islands their master could never see ; and as the little caravels steered on their way the islands melted (for they were cloud islands,) melted into the thin air. The sailors of Columbus are but the types of those students entering into the domain of natural science, who, fixing their vision on cloud islands and suffering grievous disappointment as island after island dissolves, lose their self-reliance, lament the day on which they set forth on their wanderings, and offer open mutiny to those who would guide them safely to the goal. I beg you, then, as I wish for your prosperity, to remember this simile, and to be mindful so to adhere in the early part of your careers to the cultivation of positive knowledge, that if it ever be your fate to venture into the open sea, you, like Columbus, may have such a foundation of abstract truth to rest upon as shall carry you stout of heart and reliant until the land of your discovery is in view.

But you will ask me how you are to know the real from its similitude. The secret is simple. Learn as fact all that is demonstrable to your senses. You may have heard that in studies such as yours, there is little pretence to demonstration. The insinuation is untrue. You will have to learn anatomy—human and comparative. That carries with it direct demonstration. You will learn physiology ; the best of that admits of direct demonstration. You will learn operative science ; that may be exact in its teachings. You will learn the physical properties of elements and compounds ; and here too the demonstrable is the possible. There is in short, in all these sciences, enough to be acquired in positive knowledge to occupy the first five years in the life of any student. If I were asked, indeed, to write a library of science for educational purposes, I would throw all present systems aside, and begin each series with a lesson-book, showing what in that department has been actually proved. As there are no such ready method at hand, you must grub out the system for yourselves—a task you will readily perform if you remember the simple rule, that a natural fact is always a demonstration.

At the same time, bear strictly in mind that it is by no means necessary to place a low estimate on the advancement of knowledge by logical theory; nor am I desirous to prevent you from the pursuit of first-class theoretical learning. The highest genius of men of all sciences has exhibited itself in the construction of theory, and much interesting knowledge is based on nothing else. I wish you simply to let alone the theoretical until you have grasped the actual. This achieved, the further wish is mine, that the genius of Newton for theoretical contemplation may be yours.

Another mental faculty, which I would have you cultivate, is that of *learning by gradation*, step by step from fact to fact, from mastery of facts to their combinations, and from thence to the study of theory, as placed on these facts, single or combined. On this point, the admirable Locke, whose essay "*on the conduct of the understanding*" should be bought by you all as the first of class-books, has an observation which in its depth and simplicity has never been surpassed. Thus it runs:—

"The surest way for a learner in this, as in all other cases, is not to advance by jumps and large strides; let that which he sets himself to learn next, be indeed, the next, *i.e.*, as nearly conjoined with what he knows already as is possible: let it be distinct but not remote from it, let it be new, and what he did not know before, that the understanding may advance; but let it be as little at once as may be, that its advances may be clear and sure. This distinct gradual growth in knowledge carries its own light with it in every step of its progression in an easy and orderly train, than which there is nothing of more use to the understanding. And though perhaps this may seem a very slow and lingering way to knowledge, yet I dare confidently affirm whoever will try it in himself, or any one he will teach, he shall find the advances greater in this method, than they would, in the same space of time, have been in any other he could have taken. For the greatest part of true knowledge lies in a distinct perception of things in themselves distinct."

I should spoil the whole effect of my proposition, were I to attempt to qualify or to add to so masterly and clear an exposure of its truth and its promises.

A last principle which I would suggest to you as to be remembered in your philosophical pursuits, I shall designate *concord*. We may consider this principle as bearing with it two motives, as applying, that is to say, to one's self and one's own studies, and to others and to their proceedings. As applying to your own pursuits, it simplifies them, and strengthens their realities. As in music the word concord suggests two distinct notes, which struck together make a new and perfect sound, as well as an infinitude of such combinations, all in harmony; so in the other sciences the word conveys to the educated mind the unities of science, and the modifications, however endless, which are built of the unities. It is indeed by knowledge of this concord, that the man of true genius is separated from the man of ordinary acquirements.

The latter is always doing the drudgery of detail, learning individual intervals and discovering more. The former puts these together and finds the combinations. The one makes the instrument, the second writes the inspiration. They may both be useful in their way, but I would have you of the first.

But the word concord expresses an idea of more common-place character, but not less useful to us as men. It recalls to the classical mind "Concordea," and her temple by Camilius, It conveys in this sense the lesson that, for the proper pursuit of science, concord with other minds is necessary. A difficult suggestion this, I know, one hardest of all to carry out, for mind is the most unstable attribute in nature. But if there is one means more than other by which, in your relations with your fellows, moral concord is to be sustained, it is this: That you mark out your own business and mind that; and that, if you have anything to say original on your part, you say it with care and modesty, and leave it there as it has been spoken, content to hold to it, to modify it, or to withdraw it, as time and truth shall show its worth; but entering into no petty war as to its merits, and wearying no one by protestations as to its importance.

I press these commendations earnestly on your minds. The time, not less than the opportunity, bids me to the act. There is now extant in science a class of men by whom science herself is stripped, and by whose clamor she is shaken to her centre. This class of men, having in themselves no ardent love for nature, having no true ambition, having neither courage nor industry for personal work, and having no method in their lives, seek notoriety, seek position, by systematically lying in wait to entrap and crush independent labor and individual exertion. With the least pretension to be the critics' work these become the critics of the day, and as they learn the arts of supplanting logic by plausibilty, and fact by perversion of it, they gain unquestionably a temporary influence, which brings to the true and honest heart the most embarrassing of all difficulties. You will meet these difficulties best by avoiding all entanglement with them. By yourselves never assuming the position of arbitrator; and by treating every critical word against your own well-intentioned and, to your best ability, truthful work, in one unanswerable argument—*absolute silence.*

I might, perchance, extend these observations as to the mode and advancement of learning; but if in that which has preceded the four cardinal principles—*self-reliance, solidity, gradation,* and *concord*—have been enforced with any success, the rest or the sequential may well wait.

It remains now for me but to point out the rewards which follow the pursuits of natural and professional knowledge.

It were unnecessary for me to denote the value of knowledge in the abstract, or to labor at elaborating a sentiment long since expressed in three words, "Knowledge is power." Yet I must for a moment rest to observe that, to the younger members of the profession I address, there are certain particular and substantial advantages to be derived from it worthy of their most sanguine and purest hopes. There are before them for competition immediate honors. There are the ultimate rewards—an advancing social status, a certainty and precision in practice—a superiority in thought, manner and act,—the appreciation of the public and the road to scientific fame.

Speaking as a scientific man, I know of no class to whom the honors of science are so freely offered as to the dentist. His occupation, at once professional and remunerative, permits of quiet for the most contemplative studies. The medical man, with a load of responsibilities ever on his shoulders, with human life resting on his skill, and anxious friends hanging on his lips for hope, has some excuse if, in the active practice of his special science, he leaves the general. The dentist, having no such responsibilities, has no such excuse; and if, with present advantages before him, he allows medicine still to take the lead in general learning, his supineness is unpardonable.

But, gentlemen, I should fail sadly in completing this day's most refreshing task did I not point out to the student, now for the first time entering his new life, that above and beyond all I have promised him as the reward of his exertions there is a result derivable from them which neither fortune can modify, nor time remove, nor death destroy. I mean that in the studies with which he will grow conversant there is implied a communion with the good and the beautiful, which calms passion, subdues pride, and fills the mind with the ever-constant impression that what is must remain, and that an universal essence from which we are none of us removed, holds all creation in one common bond, and by an universal sympathy.

There is an ancient fable that Orphæus, or Philosophy, going into solemn solitude, by one magic touch of his lyre drew to him natures of all kinds, and by the sweetness of his melody made them as one in general harmony of feeling, and in the appreciation of the influence which so charmed their lives. There is hidden in this exquisite fable more than at first appears. It represents in figurative terms the harmony of nature and the all-pervading influence exerted on intelligent beings by that harmony in its fulness.

Beautifully, forcibly, is the lesson here taught, but weak when compared with that modern and less obscure expression, which explains in direct terms that the elevating and combining influences of natural pursuits rest on the fact that they by necessity, in proportion as we cultivate them, lead us nearer and nearer to the beginning and end of all.

Shall I hesitate at a sentence? or tremble over a thought that may surpass the Grecian fable? I need not. The poet physician Akenside, in one paragraph, redundant of all I could say, lends me this last impression to leave with you:

> "The men whom nature's works can please
> With God himself hold converse. Grow familiar
> Day by day with his conceptions, act upon his plans,
> And form to His the relish of their souls."

[*London Dent. Rev.*

# ARTICLE XVI.

## *Report on Tumors of the Jaws and their Operative Treatment.*

[From Medical Times and Gazette, Sept. 3, 1859.]

During the last six years numerous cases have been mentioned in our Hospital Reports (statistical and otherwise) illustrating the pathology and surgery of tumors of the upper and lower jaw. These we now propose to bring together in a concise summary. We will take first those cases requiring severe surgical operations; and these it will be convenient to divide into two classes; first, those requiring resection of the upper jaw; and, second, those in which large portions of the lower jaw were removed. In both of these we of course leave unnoticed cases of necrosis, as the operations required in them are trivial as compared with those in which morbid growths are present. A third series of operative cases will comprise cases of epulis, and after this we shall, under their different heads, briefly review such other affections as occasionally require surgical interference.

Resection of the upper maxilla is emphatically one of the triumphs of modern surgery. It is but thirty years since its first performance, and during that space of time it has been instrumental in saving many lives. Its victims have besides been very few, experience having proved that it is not really the very formidable procedure which conjecture might suppose. To Mr. Lizars (1827) of Edinburgh, is due the credit of having been the first to suggest and attempt it; and to Mr. Syme (1829) that of having been the first British surgeon who performed it. In France, however, it would appear to have originated simultaneously, without any knowledge on the part of its proposer, of Mr. Lizars' case. In the same year as the latter was attempted, M. Gensoul, of Lyons, performed it, we believe, successfully. Since then it has been repeated by many surgeons; amongst whom we must mention prominently Mr. Syme, Mr. Fergusson, and Mr. O'Shaugnessy. The latter surgeon, in Indian practice, successfully employed it for the extirpation of an unusually large mass of morbid growth.

The following is a seriatim list of such cases as have been reported in our pages during the last six years:—

### RESECTIONS OF THE UPPER JAW.

Case 1.—St. Bartholomew's Hospital, July, 1853.—In this case, Mr. Lawrence excised the left upper maxilla, on account of malignant disease, commencing in the antrum. The patient recovered well, as far as the operation was concerned, but the disease rapidly returned.

Case 2.—St. Bartholomew's Hospital, October, 1853.—Mr. Stanley extirpated the entire bone with the exception of its nasal and orbital processes on account of a fibroid tumor which had returned after a former excision. The patient recovered well, and the extirpation was, we believe, permanently successful.

Case 3.—Charing-cross Hospital, October, 1853.—Mr. Hancock. In this instance the excision was a complete one, the disease being suspectedly of a malignant nature. The patient recovered well.

Case 4.—Guy's Hospital, November, 1853.—A man aged 50, under the care of Mr. Cock, on account of malignant disease, involving the antrum, and upper maxilla. Almost the entire bone was removed, and with a good result, inasmuch as the man quickly recovered. We believe, however, that the disease recurred within a short period.

Case 5.—St. Thomas' Hospital.—A married woman, aged 53, was admitted into St. Thomas' Hospital on November 29, 1853, under the care of Mr. Le Gros Clark. Her disease was a large malignant growth involving right upper jaw. The growth had been excised by a provincial surgeon about five months before, but had rapidly recurred. The whole duration of the disease was two years and a half. Her general health was still pretty good. Mr. Clark performed excision of the affected maxilla, only the floor of the orbit being left. There was but little hemorrhage. The woman made an uninterruptedly good recovery. She was still quite well when she came under notice again, six months afterwards, but we believe that eventually the disease returned.

Case 6.—The Derby Infirmary, 1854.—The patient was a man aged 49, in tolerably good general health. He was under the care of Mr. Fox, of the Derby Infirmary, for a tumor which had distended the antrum, and which had existed for nearly a year. The tumor was believed to be malignant, and it had grown forwards so as to protrude the cheek, and backwards so as to depress the soft palate. The case had been roughly treated by a quack doctor, prior to the man's admission at the hospital, who had made incisions into it from the mouth, and had applied caustics. As no fungoid growths had followed these measures, it was hoped that the disease was not of the most malignant type. Mr. Fox excised the entire maxilla, adopting the plan of operating advised by Mr. Fergusson. After removal of the bone, such portions of the growth as had passed upwards or backwards were carefully removed by the scoop. The characteristics of medullary cancer were well marked in the tumor. The incisions in the skin soon healed, and the chasm left was rapidly filled by granulations, which were, however, of somewhat suspicious character. At the time the man left the hospital there was reason to fear that the the disease was already returning.

Case 7.—King's College Hospital, 1856.—A girl aged 13, in good health, was admitted under Mr. Fergusson's care, on account of an osseous growth distending the left antrum. It had been observed to be increasing for three years. Excision of the greater part of the left upper maxilla was performed, the cheek having been dissected up after a single incision through the upper lip. In the osseous mass was one of the incisor teeth. The girl recovered well, and with very little resultant deformity.

Case 8.—King's College Hospital, 1856.—A man aged 56, under the care of Mr. Fergusson, on account of a very osteo-encephaloid growth in the left upper maxilla. It was of twelve years' growth, and he was much reduced in health. An incision, which involved the upper lip only, having been practiced, the cheek was dissected up, and room enough gained to admit of the removal of the entire maxilla. No great amount of blood was lost. Death, with symptoms resembling those of commencing pyæmia, occurred on the fifth day. At the autopsy pus was found in the glands and cellular tissue of the neck.

Case 9.—King's College Hospital, 1856.—A girl aged 16, under Mr. Fergusson's care, for a large osseous growth, involving the right upper maxillary and malar bones. The whole maxilla and part of the malar bone were removed, the only external incision being through the upper lip. The girl recovered well, and left the hospital about a month afterwards.

Case 10.—King's College Hospital, 1856.—A girl, aged 10, under Mr. Fergusson's care. The entire right upper maxilla was excised by the usual operation. The disease proved to be tuberculous deposit in the antrum and surrounding bone. The child, we believe, recovered well.

Case 11.—The Liverpool Royal Infirmary, 1856.—A healthy married woman, aged 23, was admitted under Mr. Bickersteth's care, on account of a solid and hard growth under the left cheek, which caused general enlargement of that side of the face. It was of seven years' growth, and had increased painlessly. In the mouth the left side of the palate was found to be pushed downwards. The case had all the features of an osseous tumor of the antrum and maxilla, and the entire bone was accordingly removed by the usual operation. In extricating the bone profuse hemorrhage suddenly occurred, from the tearing of a large artery (probably the internal maxillary,) but it was arrested by ligature, the carotid having meanwhile been compressed. The patient had an attack of erysipelas afterwards, but she ultimately recovered well. The tumor when sawn across proved to be a bony growth, occupying the interior of the antrum, the whole of which it filled with the exception of a small space capable of holding a pea.

Case 12.—King's College Hospital, 1857.—A robust-looking man of middle age, in whose left upper jaw a tumor had been growing for upwards of four months. The growth extended across the mesial line in the palate, and also involved the malar bone of the opposite side. The whole of the involved maxilla and parts of the malar bones were resected in the usual manner. The man recovered quickly, and was discharged well six weeks afterwards, but Mr. Fergusson expressed himself as having grave fears that the disease would recur.

Case 13.—The Leeds Infirmary, 1857.—A woman, aged 22, was admitted under Mr. Teale's care on account of a large fibrous growth, originally developed within the right upper maxilla, but which in its growth had also involved parts of the left. Excision of the entire right bone was performed, a considerable portion of the left being also removed. The operation involved the loss of much blood, and the patient sank exhausted and died the following day.

Case 14.—The Queen's Hospital, Birmingham, 1857.—A woman, aged 55, under Mr. Langston Parker's care, on account of malignant disease of the right upper maxilla. Excision of almost the entire bone was performed on April 21st. The growth was found to occupy the cavity of the antrum. A good recovery resulted, and at the date of report (four months after) there was no evidence of return of the disease.

Case 15.—The Salford Royal Hospital.—A healthy-looking woman, aged 42, under the care of Mr. Thomas Windsor. The right cheek was distended by a firmly-fixed tumor, which had been growing for four months, and had ulcerated through the palate. On April 15, 1857, Mr. Windsor excised the entire bone, which however, broke into fragments during the removal. There was but little bleeding, and the woman did well for the first twenty-four hours. Subsequently diffuse inflammation of the cellular tissue of the neck followed. From this and from erysipelas of the face she sank on the fourteenth day. The disease was soft cancer, and had begun in the antrum.

Case 16.—St. Thomas' Hospital, July, 1858.—A lad, aged 18, under the care of Mr. Simon, on account of a large polypoid tumor developed in the left upper maxilla. Malignancy was not suspected, but it was evident that the base of the growth could not be got at without extirpation of the bone. The entire maxilla was accordingly resected, and the polypus, which had an exceedingly broad base of attachment to the cranium itself, was got away. The lad recovered well, and, as usual, with but little deformity.

Case 17.—The London Hospital.—In this case, a man, aged 43, under the care of Mr. Adams, had his left upper maxilla excised, on account of a polypoid growth filling the antrum. He made a good recovery.

We have arranged the above seventeen cases in the subjoined table.

It will be seen that out of the seventeen only three ended fatally. In several others there was, however, the disappointing sequel that the disease was malignant, and quickly returned.

### TABULAR STATEMENT OF RESECTIONS OF THE UPPER JAW.

| No. | Sex. | Age. | Bone affected. | Nature of Disease. | Result. | Cause of Death. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1 | .. | .. | Left. | Malignant. | Recovered. | .. | The disease rapidly returned. |
| 2 | .. | .. | .. | Fibroid. | Recovered. | .. | Believed to be permanently well. |
| 3 | .. | .. | .. | Malignant. | Recovered. | .. | |
| 4 | M. | 50 | .. | Malignant. | Recovered. | .. | The disease rapidly returned. |
| 5 | F. | 53 | Right. | Malignant. | Recovered. | .. | |
| 6 | M. | 49 | .. | Malignant. | Recovered. | .. | The disease was believed to be returning. |
| 7 | F. | 13 | Left. | Osseous. | Recovered. | .. | Permanent recovery. |
| 8 | M. | 56 | Left. | Osteo encephaloid 12 years. | Died. | Commencing pyæmia fifth day. | The tumor was very large |
| 9 | F. | 16 | Right. | Osseous. | Recovered. | .. | Permanent recovery. |
| 10 | F. | 10 | Right. | Tuberculous | Recovered. | .. | |
| 11 | F. | 23 | Left. | Osseous 7 years. | Recovered. | .. | |
| 12 | M. | 45(?) | Left. | Malignant 4 months. | Recovered. | .. | |
| 13 | F. | 22 | Right. | Fibroid. | Died. | Exhaustion, 1 day. | The tumor was very large |
| 14 | F. | 55 | Right. | Malignant. | Recovered. | .. | |
| 15 | F. | 42 | Right. | Malignant. | Died. | Erysipelas, &c., 2 weeks. | In good health at the time of operation. |
| 16 | M. | 18 | Left. | Polypoid. | Recovered. | .. | The polypus grew by a broad base from the skull itself. |
| 17 | M. | 43 | Left. | Polypoid. | Recovered. | .. | The polypi occupied the antrum. |

### OTHER CASES OF MALIGNANT DISEASE OF THE UPPER JAW.

At page 476 of the "Medical Times and Gazette" for November 7, 1857, the reader will find some particulars of a case in which there was little doubt that the upper jaw was involved in a cancerous growth. The patient was a healthy-looking young man of 23, under Mr. McWhinnie's care in St. Bartholomew's Hospital. The performance of excision was declined on account of the growth having advanced too far upwards to permit of it. The right side was affected, and the disease had existed only seven months.

In September, 1854, a man, aged 25, was under the care of Mr. Richard Hey, in the York Hospital, for a malignant tumor occupying the antral cavity. Mr. Hey cut away the front wall of the antrum and scooped out the morbid growths. The parts healed, but we do not know the final result of the case.

An especially interesting case has also been recently under notice, in which a boy from the country, under Mr. Critchett's care at the Ophthalmic Hospital, had cancer of both upper jaws. The disease appeared to have developed itself symmetrically, but from quite distinct points in the two bones. In each instance it grew upwards and displaced the eye. The boy died within a year of its commencement.

### RESECTIONS OF PORTIONS OF THE LOWER JAW ON ACCOUNT OF TUMORS.

Case 1.—The Winchester Hospital, 1853.—In this case Mr. Butler excised the right half of the lower jaw on account of a malignant growth from the periosteum. The tumor had been growing for two months, and after removal presented the characters of epithelial cancer. In the course of a month after the operation, and before the wound was quite healed, the disease had returned. Death resulted three months later.

Case 2.—St. Thomas' Hospital, June, 1854.—A man, aged 28, cachectic and of very nervous temperament, was under Mr. Macmurdo's care for malignant disease developed within the bone. It was growing rapidly and expanding the bone on its exterior. The left half of the jaw was excised; the operation being attended with but little loss of blood. The patient did well for about ten days, when he was attacked by erysipelas, under which he sank about a fortnight after the operation. The tumor after removal proved to be of the fibro-plastic or myeloid class. No examination of the viscera after death was permitted.

Case 3.—A Provincial Hospital, 1854.—A woman, aged 40, in very feeble health, had excision of the right half of her lower jaw performed on account of a large fibrous tumor, which had been developed within it, and had been steadily increasing for upwards of three years. Soon after the operation a severe attack of diarrhœa with menorrhagia came on and occasioned much exhaustion. Symptoms of pyæmia subsequently developed themselves, and death followed on the thirty-third day. At the autopsy pus was found beneath the scalp, and there were deposits in the lungs and muscular substance of the heart.

Case 4.—King's College Hospital, April, 1855.—A healthy man, aged 31, was admitted under Mr. Fergusson's care on account of a large tumor in the left side and front part of the lower jaw, which had been slowly increasing for more than three years. The excision involved the removal of the bone from the anterior edge of the left masseter, as far forwards as the canine tooth on the right side. On dissection the bone was found occupied by cysts which contained a gelatinous fluid, its external layer having been expanded until as thin as parchment. The patient recovered well after the operation.

Case 5.—Addenbrooke's Hospital, Cambridge, 1856.—A healthy-looking man, aged 28, was admitted in November, 1856, under Mr. Humphry's care, with a large tumor, resembling an epulis growing from the lower jaw. It was of a year's duration, and involved nearly the entire depth of the bone from the first bicuspid to the second molar. In the operation an incision was carried from the angle of the mouth downwards and backwards nearly to the angle of the bone. The saw was next used, and the tumor, with the whole of the tract of the bone involved, excepting a mere rim at its lower border, was removed. The wound quickly healed, and the man was discharged in about three weeks. Under the microscope cells resembling those of cancer were found.

Case 6—The Liverpool Royal Infirmary, 1856.—A healthy-looking man, aged 25, was admitted, under the care of Mr. Bickersteth, with a tumor growing from the lower jaw of nine weeks' duration. It had during that period been twice excised by a surgeon under whose care the man had formerly been, but on each occasion a rapid recurrence took place. During the few days he was under

Mr. Bickersteth's observation prior to the operation, it increased in size very rapidly. The horizontal ramus of the jaw was excised to within a short distance of the symphysis. The patient recovered well, but a return of the disease was much feared.

Case 7.—The Liverpool Royal Infirmary, 1856.—A spare man, aged 62, for six months the subject of a firm tumor in the left side of the lower jaw. It was about the size of a walnut, and had been painful. Excision of the portion of jaw from which it grew was performed and the man recovered well. At the time he left the hospital, however, the disease seemed to be returning.

Case 8.—King's College Hospital, 1857.—The subject of this interesting case was a woman, aged 23. When 16 years old, she had first observed a tumor forming in the right side of the lower jaw. This was excised, together with part of the bone, by Mr. Pettigrew. The disease soon returned, and for some time the patient declined to permit any further surgical interference. When admitted, under Mr. Fergusson's care, into King's College Hospital, she still presented the aspect of good health; but the tumor was of large size, involving the angle and ramus of the bone. Mr. Fergusson resected the whole from the first molar tooth to the articulation. The bleeding at the time was very free, and it returned in the course of the evening. Death from collapse followed the next day. The disease proved to be of myeloid structure, and the fact of its recurrence became therefore of especial interest.

Case 9.—The Leeds Infirmary.—In this case the portion of the lower jaw resected was not very large. The patient was a man, aged 33, who had had an epithelial cancer excised from his lower lip about nine months before. Although the cicatrix remained quite sound, he noticed about four months after the operation that the jaw was enlarging. The tumor slowly increased, and became painful. Excision of the affected part of the bone was performed, and with a good result, as the parts healed soundly.

Case 10.—Charing-cross Hospital.—In this instance no distinct tumor existed; but the operation required was the same. The bone was much enlarged and carious at parts, as the result probably of constitutional syphilis. The patient was a sailor, aged 32. Mr. Hancock cut away the left half of the bone from its angle posteriorly to near the symphysis in front. The parts healed well.

Case 11.—The "Great Northern" Hospital, June, 1859. A girl, aged 17, was admitted for the second time under the care of Mr. Lawson. About eight months before a fibrous-looking tumor growing from the periosteum of the left side of the lower maxilla had been removed. The disease had recurred, and now involved the ramus of the jaw in a tumor of considerable size. The ramus of the jaw was exarticulated, and removed, together with the tumor, which grew from its surface. It was found impossible to get away the whole of the growth, as it had spread into the adjacent structures. The girl did well afterwards, but Mr. Lawson had but little hope that the disease would not rapidly recur. It appeared to be of fibroid recurrent character.

TABLE OF RESECTIONS OF PORTIONS OF THE LOWER JAW.

| No. | Sex. | Age. | Bone affected. | Nature of Disease. | Result. | Cause of Death. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1 | M. | .. | Right. | Malignant, 2 months. | Recovered. | .. | The disease returned, and he died in four months. |
| 2 | M. | 28 | Left. | Myeloid. | Died. | Erysipelas, 2 weeks. | The man was in bad health. |
| 3 | F. | 40 | Right. | Fibroid, 3 years. | Died. | Pyæmia, 33d day. | The woman was in very feeble health. |
| 4 | M. | 31 | Left. | Cystic, 3 years. | Recovered. | .. | |
| 5 | M. | 28 | .. | Malignant, 1 year. | Recovered. | .. | |
| 6 | M. | 25 | .. | Malignant, 9 weeks. | Recovered. | .. | |
| 7 | M. | 62 | Left. | Malignant. | Recovered. | .. | A return was feared. |
| 8 | F. | 23 | Right. | Myeloid, 6 years. | Died. | Exhaustion, 1 day. | The tumor was very large. |
| 9 | M. | 33 | Left. | Malignant. | Recovered. | .. | It was secondary on cancer of the lip. |
| 10 | M. | 32 | Left. | Syphilitic enlargement | Recovered. | .. | The bone was enlarged and carious. |
| 11 | F. | 17 | Left. | Fibroid recurrent. | Recovered. | .. | The tumor grew from the periosteum of the ramus. |

### CARTILAGINOUS AND FIBRO-CARTILAGINOUS TUMORS.

Tumors consisting only of cartilage, and resembling those so often developed in the phalanges of the fingers, occur occasionally in connexion with the jaws. They are, however, decidedly infrequent. Mr. Fergusson exhibited to the Pathological Society, in October, 1854, a specimen of this form of tumor, about the size of a hen's egg, which he had removed from the jaw of a woman aged 39. It had existed most of her life, and occupied the interior of the bone between the symphysis and the mental foramen, being encapsuled by a thin osseous shell. Mr. Fergusson remarked that the disease was undoubtedly rare, and that he had never before seen so good a specimen of it. The reporters upon this specimen (Dr. Beale and Mr. Gray) considered it to be more of fibrous than true cartilaginous structure, but Mr. Fergusson describes it "as resembling enchondroma, as seen in the phalanges of the fingers." At a meeting of the Pathological Society during its last session, Mr. Hutchinson showed a fibro-cartilaginous tumor, about the size of a pigeon's egg, which he had excised from the canine fossa of the right upper jaw. The tumor had been movable, occupying a depression in the bone, but not growing from it. The tumor consisted largely of true cartilage. The patient was a girl of about 15, under care at the Metropolitan Free Hospital. Mr. Fergusson, who was president of the society at the time, remarked that such growths in connexion with the jaws were, according to his experience, very unusual. But the best example of cartilaginous tumors growing in the jaws with which we have recently been made acquainted, is one, the particulars of which Dr. Adams, of the Richmond Hospital, Dublin, recorded in the "Medical Times and Gazette" for April 11, 1857. In it "the whole body of the lower jaw was expanded into a bony cyst, or shell, which enclosed within it a cartilaginous-like material."

The excision required involved the removal of the articular head as well as the body and ramus. The patient was 36 years of age, and the disease had followed a blow received three years before. These tumors are of course perfectly innocent. They usually commence in early life and grow very slowly.

### EPULIS.

In the following list of examples of epulis which have been operated on in our various hospitals, and recorded from time to time in our statistical reports, we have included several in which there was much doubt as to whether the tumor was not really malignant. But in truth, in respect to these tumors of the gum and alveolus, it is often very difficult to estimate their degree of deviation from the benign standard. The fibrous epulis is certainly not malignant, but it often returns after free excision. The myeloid epulis stands on more questionable ground, will ulcerate and fungate, and now and then may cause enlargement of glands, whilst a third class presents itself which is more suspicious, whilst yet not by any means possessing clear and positive characteristics of cancer. Our data have not enabled us in the following list to distinguish between fibrous and myeloid, but we have mentioned the circumstance whenever the disease was believed to be malignant.

TABULAR STATEMENT OF TWENTY-EIGHT CASES OF EPULIS.

| No. | Sex. | Age. | Duration. | Position. | Result. | Remarks. |
|---|---|---|---|---|---|---|
| 1 | F. | 35 | .. | Upper. | Recovered. | |
| 2 | M. | 39 | 15 months. | .. | Recovered | |
| 3 | F. | 60 | 7 months. | Upper. | Recovered. | |
| 4 | F. | 50 | 8 months. | Upper. | Died. | Rigors followed the operation, and death from pyæmia on the 15th day. |
| 5 | M. | 16 | 8 years. | Lower. | Recovered. | |
| 6 | F. | 60 | 20 years. | Upper. | Recovered. | Very large indeed. It had returned after removal 8 years before. |
| 7 | F. | 26 | 9 months. | Lower. | Recovered. | Large, ragged, and fungating. It was fibro-cartilaginous. |
| 8 | M. | 36 | .. | Upper. | Recovered. | It was thought after removal to be of cancerous nature. |
| 9 | M. | 27 | 7 years. | Upper. | Recovered. | The tumor was thought to be cancerous after removal. |
| 10 | F. | 28 | 6 years. | Lower. | Recovered. | The tumor consisted of hardish bone, and had encapsuled completely the stumps of two teeth. |
| 11 | F. | 11 | .. | Lower. | Recovered. | |
| 12 | F. | 36 | 18 months. | Lower. | Recovered. | Caused by a decayed tooth. |
| 13 | M. | 24 | .. | .. | Recovered. | |
| 14 | F. | 30 | .. | Upper. | Recovered. | |
| 15 | F. | 23 | 14 months. | Lower. | Recovered. | Two bicuspid teeth were buried in it. It was of myeloid structure. |
| 16 | F. | 22 | 2 years. | .. | Recovered. | It involved two teeth. |
| 17 | M. | 16 | 1 year. | Lower. | Recovered. | It involved the last bicuspid and first molar. |
| 18 | F. | 31 | .. | Lower. | Recovered | The tumor was soft and fungoid. |
| 19 | F. | 30 | .. | Lower. | Recovered. | |
| 20 | M. | 9 | .. | .. | Recovered. | |
| 21 | F. | 22 | .. | Lower. | Recovered. | |
| 22 | M. | 40 | .. | .. | Recovered. | |
| 23 | M. | 40 | .. | .. | Recovered. | It was ulcerated, and considered to be malignant. |
| 24 | M. | 10 | .. | Lower. | Recovered. | As large as a walnut. |
| 25 | M. | 51 | .. | Upper. | Recovered. | |
| 26 | F. | 47 | 5 months. | Upper. | Recovered. | |
| 27 | F. | 24 | .. | Lower. | Recovered. | The bleeding which followed required the actual cautery for its arrest. |
| 28 | F. | 78 | .. | .. | Recovered. | The tumor was pedunculated, and was removed by ligature. |

Of these 28 cases, in which tumors growing from the gum were of the character usually designated as "epulis," we may make the following summary:—In but one instance did the operation cause the death of the patient, whilst in all the others the parts implicated are stated to have healed soundly. It would appear that the female sex is more liable to this disease than males, in the proportion of 5 to 3, the numbers in the list being 17 females and 11 males. This may perhaps be explained by reference to the fact, that stumps of decayed teeth are by far the most frequent exciting causes of these growths. Now women are, for several reasons, more likely to retain useless stumps of teeth than men. They are far more patient as regards severe, unavoidable pain, such as that of toothache, and at the same time much more afraid of surgical pain, as that of tooth extraction; besides, it must be remembered, that the conditions either of pregnancy or lactation prevent many women from having their decayed teeth taken out at the time when they ache.

As it regards *age*, we find that the youngest patient was a boy of 9, and the next to him a girl of 11, whilst the oldest was a woman of 73, and the next to her another woman of 60. Five were under the age of 20; eight between those of 20 and 30; seven between 30 and 40; three between 40 and 50; two between 50 and 60; and three above 60. The average of the whole is 33.

The lower jaw seems rather the more frequent seat of epuloid tumors. In twelve out of twenty-one cases in which we possess information on this point, the growth was from the lower gum, and in nine only from the upper.

It is a curious fact, that epulis tumors are hardly ever seen in the front gum, but almost invariably at one or the other side. Of course the greater extent of the lateral regions, and the fact that for each central tract there are two lateral ones, explain this to some extent. The increased irritation of the many-fanged molars, as compared with the incisors, must be taken also into the account.

### MULTILOCULAR CYSTIC DISEASE.

In case 4 of the above series of excisions of parts of the lower jaw, the disease is stated to have consisted of numerous cysts filled with gelatinous material, which occupied the body of the bone. The osseous shell was, in many parts, as thin as parchment. A parallel case to this has also been recorded by the Dublin surgeon just alluded to (Dr. Adams.) The patient was a man, aged 36, and the disease had existed for three years. As in Mr. Fergusson's case the cysts were developed in the body of the lower jaw, and almost a similar operatiou was required. In the same report Dr.

Adams refers to (and figures the specimen) a third case of cystic disease of the lower jaw, which had been recorded by Mr. Cusack many years before.

### FIRM FIBROUS TUMORS.

In January, 1858, Mr. Cock had under his care, in Guy's Hospital, a boy, aged 9, in whom a tumor was embedded in the left side of the lower jaw, near to its symphysis. The growth had followed a blow received two years before. It was excised, and proved to be a firm fibrous tumor, of about the size of a walnut. It was not encapsuled in the bone at the time of the operation, but occupied a depression in its surface. It surrounded the mental nerve, and had probably been originally developed in its canal. Respecting several of the cases in the above series in which the term "fibroid" has been used, we are at some loss how to class them. Some so described were possibly truly fibrous; others probably of myeloid nature; and others, again, very closely allied to cancer, or, at any rate, to the recurrent fibroids. The above is the only undoubted instance of an ordinary fibrous tumor developed in connection with either jaw, that has recently come under our notice.

### *Exostosis from the Lower Jaw.*

In one instance Mr. Erichsen removed from near the symphysis of the lower jaw an exostosis of moderate size, which had been increasing several years. The patient was a woman, aged 22. This is, we believe, the only example of exostosis developed in this situation which our lists contain.

### *Recurrent Fibroid Tumor Developed in the Antrum.*

The only example which we have to quote of recurrent fibroid tumor developed in connexion with the jaws is one in which the diagnosis of that variety of tumor and true cancer is by no means positive. It is that of a woman, aged 34, under Mr. Cock's care, in Guy's Hospital, at different times for two or three years (1854 and 1856.) The growth occupied the right antrum, and extended into the nose; on several occasions Mr. Cock dissected up the cheek in front, laid bare the cavity, and gouged out the tumor and the bone to which it was attached. The parts always healed quickly, but the disease soon returned. The tumor had the microscopic features of a recurrent fibroid, as distinct from those of a true cancer, and the fact that it continued to recur in the same place, but did not cause disease of the glands, is confirmatory of that diagnosis. The woman was very pallid and cachectic, but her cachexia did not exactly resemble that of cancer. We lost sight of her towards the end of 1856, and do not know the final result of her case. Probably she has since died of her disease.

### *Cystic Distension of the Antrum.*

Several good examples of cystic distension of the antrum have been recorded in the Medical Times and Gazette during the period now under review. In this curious affection the antral cavity becomes filled with a glairy mucous fluid closely resembling that of ranula, the outer wall is distended and thinned, and the cheek becomes visibly full and swollen. Often on touching the cheek, a sensation of crackling as of paper is produced, owing to the extreme thinness of the external osseous wall. On opening the antrum it is found of great capacity, but not containing any morbid growths, either solid or membranous. The disease is, therefore, rather a distension of a natural cavity than a true cystic formation. It would appear that women are more subject to this affection than men.

The following are examples of it:—Case 1.—A woman, aged 31, was admitted in October, 1855, into Guy's Hospital, under the care of Mr. Cock. Her right antrum was so distended that the osseous wall in front had been wholly absorbed. Mr. Cock dissected upwards between the cheek and gum, and cut away with strong scissors as much as possible of the front wall of the cyst, which was tough and fibrous. The glairy contents having been evacuated, the cavity was stuffed with sponge and left to suppurate. When the woman left the hospital the cyst appeared to have been obliterated.

Case 2.—Under the care of Mr. Teale, in the Leeds Infirmary. It was necessary to employ bone forceps in cutting away the front wall of the dilated antrum.

Case 3.—A girl, aged 14, under the care of Mr. Hilton, in Guy's Hospital, on account of a large prominent swelling of the left upper maxilla. Mr. Hilton diagnosed a cyst either in or connected with the antrum. The operation consisted in dissecting up the gum and soft parts, and then with a strong pair of scissors opening the front wall of the swelling, which consisted of thin and expanded bone. Nearly two ounces of thick, glairy fluid escaped. Some lint was afterwards introduced into the wound. After some slight suppuration, during which a lotion of the sulphate of zinc was used as an injection, the cavity filled by granulation, and the wound closed. The cure was complete, and all deformity of the cheek subsequently disappeared.

Case 4.—The patient was a woman of about 35, under Mr. Hutchinson's care in the Metropolitan Free Hospital. The cyst had been opened several times, but always when the puncture closed it refilled. On one occasion, at another hospital, an attempt had been made to prevent the opening from healing, but unsuccessfully. In front was a thin shell of bone. Mr. Hutchinson laid the cyst freely open, and stuffed it with sponge, which was left in for four days. After the removal of the sponge, injections of chlorate of potash were employed to correct the fetor of the discharge. It is believed that the obliteration was complete.

## *Cyst in the Upper Jaw, Enclosing a Tooth.*

Of this peculiar class of cases we have but one example, which is as follows:—

A young woman, aged 18, admitted into Guy's Hospital under the care of Mr. Cock, having for some time suffered from a painful swelling of the gum of the left side of the upper jaw, over the incisor teeth. An incision had been made into it by a surgeon who had previously seen her, and a portion of gum removed, but without benefit. It was found that the permanent lateral incisor tooth of that side had not appeared, and that its position was still occupied by a small deciduous one. Mr. Cock's diagnosis was that the tumor was probably connected with some malposition of the permanent tooth. Mr. Salter, the dentist to the hospital, saw the patient, and extracted the deciduous tooth, which was found firmly fixed, and its fang unabsorbed. No further information as to the nature of the swelling in the jaw was gained by this measure. Mr. Cock determined, accordingly, to open the swelling and examine. This was done by means of small bone forceps, by which, after the gum had been detached, a portion of the anterior part of the jaw, just above the alveolar process, was cut away. A cavity of irregular shape, and about capable of containing a large marble, was laid open, and after some search the wanting tooth was found at its further extremity. The tooth was a large, fully-formed, permanent incisor, beautifully white, and complete in every respect, excepting that its fang terminated abruptly in a rounded end at about its middle. The wound was left to heal by granulations, which it rapidly did without any inconvenience. It is intended, by the aid of the dentist, to have the tooth fixed in the position it should have occupied.

## ARTICLE XVII.

## *Remarks on Anæsthesia, and the agents employed to produce it.* By GEORGE HAYWARD, M. D., late Professor of Surgery in the Massachusetts Medical College, Boston, U. S. A.

THE discovery by which surgical operations can be rendered painless is one of the greatest connected with our profession, second only to that of vaccination. It is a blessing to the human family that cannot be overrated; and having been among the first to make a successful use of it in surgical practice, I thought that a brief sketch of the history of anæsthesia, and some remarks on the comparative value of the agents employed to produce it, would not prove uninteresting.

It was my fortune to perform the first capital operation on a patient rendered insensible by the inhalation of sulphuric ether. This was done on November 7th, 1846, at the Massachusetts General Hospital, Boston. On September 30th, preceding, Dr. Morton, a dentist, administered it to a man, from whom he extracted a tooth without causing pain. Almost immediately after, he requested the late Dr. John C. Warren, who was at that time the acting surgeon at the hospital, to use it at that institution. Dr. Warren consented. It was inhaled by a patient, with partial success, on whom Dr. Warren operated on October 16th. The operation was the removal of a nævus from the face. On the day following, I extirpated a large fatty tumor from the arm of a female, who was made wholly unconscious and insensible by the inhalation of the ether. The operation lasted seven minutes.

At that time Dr. Morton was, I thought, the only person who knew what the anæsthetic agent was. On November 1st, I took charge of the surgical department of the hospital, and in a day or two after Dr. Morton asked me if I were willing to allow him to administer his "composition," as he called it, to a female whose limb I was about to remove above the knee. I told him I would not, unless I knew what the article was, and felt confident of the entire safety of its administration. He at once told me that it was rectified sulphuric ether. He allowed me to communicate this to my colleagues, with an understanding that it should not be made known publicly, until he had obtained a patent, for which he had already applied. On the following day the operation was performed, in the presence of more than two hundred spectators.

It rarely falls to the lot of a professional man to be the witness of a scene of more intense interest. The operating room was crowded. Many were obliged to stand. Besides the class of students in attendance on the lectures, numbering more than a hundred, and many of the principal physicians and surgeons of the city and neighborhood, there were present several clergymen, lawyers, and other individuals from the various callings of life. When I entered the theatre, before the patient was brought in, I found it, to my surprise, filled in every part, except the floor on which the table stood, with persons on whose countenances was depicted the almost painful anxiety with which they awaited the result of the experiment they were about to witness. I simply told them that I had decided, with the advice of my colleagues, to allow the patient, on whom I was to operate, to inhale an article which was said to have the power of annulling pain. The patient was then brought in. She was a delicate-looking girl of about 20 years of age, who had suffered for a long time from a scrofulous disease of the knee-joint. It had at length suppurated; there were extensive openings into the cavity of the joint; the cartilages were ulcerated and partly absorbed; the bones carious, and symptoms of hectic fever had already made their appearance. As soon as she was well arranged on the table, I told her that I should let her breathe something which, I hoped, would prevent her from suffering much from the operation, and that she need not be afraid of breathing it freely.

As the ether was at the time administered by means of a large and clumsy instrument, which required to some extent the coöperation of the patient, it was desirable that the amputation should be done as rapidly as possible. Everything, therefore, was arranged with this view. I decided to perform the flap operation. One person was to compress the artery, another to withdraw the flap, a third to hand the instruments, and a fourth to watch the pulse. I grasped the patient's limb with my left hand, and held the amputating knife behind me in my right, carefully concealed from her view. The mouthpiece of the inhaling instrument was then put into her mouth, and she was directed to take long inspirations. After breathing in this way a short time, the nostrils were compressed, so that all the air that went into the lungs must first pass through the machine, and of course be mixed with the vapor of the ether. She breathed with perfect ease and without struggling, and in about three minutes from the time the instrument was put into her mouth, Dr. Morton said, "she is ready." A death-like silence reigned in the room; no one moved or hardly breathed. I passed the knife directly through the limb, and brought it out as rapidly as I could, and made the upper flap. The patient gave no sign of feeling or consciousness, but looked like one in a deep, quiet sleep. Every other person in the room took a full inspiration that was distinctly audible, and seemed to feel that they could now breathe again. The second flap was then made, the bone sawed, five arteries were tied, and as I was tightening the ligature upon the sixth and last, she groaned, being the first indication of sensibility that had been given. Nothing more was done than to bring the flaps together, cover the stump with cloths dipped in cold water, and apply two or three turns of a roller to keep them in place. Her consciousness soon returned; she was wholly ignorant that the operation had been done. For some time she would not believe it, and said that she had felt nothing till I tied the last artery. The operation lasted a minute and three quarters, not including the time required to tie the arteries. I did it rapidly, though it has been done in less time, because I feared that the insensibility might pass off, and we had no means then, as we have now, of continuing it as long as is necessary.

Patients who have inhaled ether, when its effects are at first passing off, are usually bewildered, not easily controlled, and by no means inclined to do as they are desired. It would be almost impossible to persuade one of them at such a time to breathe through the instrument that was then in use. At present, fortunately, we can keep up the state of anæsthesia as long as we wish, by administering the agent employed for this purpose by means of a sponge. This simple contrivance was first used at the Massachusetts Hospital.

The patient whose case I have just spoken of recovered rapidly from the operation, was in good health when I left home eleven years after, and I have no reason to suppose that she is not so at the present time.

It will be readily believed that a result so successful, and witnessed by so many intelligent persons, made it impossible to doubt the anæsthetic power of the agent employed, and what this was very soon became known. In an almost incredibly short space of time, numerous operations were performed on persons rendered insensible by the inhalation of ether, in various parts of the United States and Europe, and there is hardly a country in christendom in which it has not been thus used to a greater or less extent.

*The Anæsthetic Agents.*—These are sulphuric ether, chloroform, chloric ether, and amylene. The two latter are now rarely used for this purpose, and probably never will be again. Chloric ether is simply a tincture of chloroform. There are two kinds, one the concentrated and the other the chloric ether of commerce. The first is composed of one part of chloroform to nine of alcohol, and in the other ther is one part of chloroform to fifteen of alcohol. It can be prepared by mixing the two ingredients of which it is composed in the proper proportions, and if the alcohol which it contains be evaporated, nothing but chloroform remains. It is evident that it derives its anæsthetic properties from the chloroform, and it is therefore as unsafe as that article; for the alcohol, though it renders it less efficacious, does not make it more harmless.

*Amylene*, the chemical elements of which are equal parts of carbon and hydrogen, has caused death in several instances. There have been so many fatal cases in proportion to the number in which it has been exhibited, that no one hereafter will probably be sufficiently reckless to use it.

*Chloroform* was first employed by Professor Simpson, of Edinburgh, who thought that it possessed "various important advantages" over sulphuric ether. He said that it was more portable, more agreeable to inhale, less exciting, and that it gave a greater control over the patient. That it is more portable and more agreeable to inhale, I admit, but that it is less exciting and a more efficient anæsthetic agent, I deny. But the principal objection to it is, that its inhalation sometimes causes death. Its advocates admit that this has occurred in sixty cases, while others believe that there has been double this number. But be the number what it may, so many have died from its inhalation, that many persons are in favor of abandoning its use altogether. Death produced by it cannot now be attributed in every instance, as it was at first, to the impurity of the article, or to the exhibition of too large an amount, or to the want of skill or judgment in the administrator. There have been several fatal cases lately, where the chloroform was said to be of the purest character, and a small quantity only inhaled, and this, too, in the presence and under the direction of intelligent, well-educated and careful men.

The truth is, that chloroform, when inhaled, acts on the system in a way that is not yet well understood, and may destroy life in spite of the utmost caution. Its effects are sometimes so sudden, that no foresight can prevent a fatal result. Unless some means, therefore, can be discovered that will render its inhalation safe, common prudence and a regard for human life would seem to dictate that it should be no longer used in this way. It is true that the state of unconscious insensibility produced by it is a blessing of countless value to those who are to undergo severe surgical operations, not only by rendering them painless, but at the same time disarming them of their terror. And these are not the only advantages of anæsthesia. It in great measure prevents the shock to the nervous system which not unfrequently defeats the skill of the most expert surgeon, it enables him to operate more deliberately, removes all necessity for haste, which is often the result of the sufferings of the patient, and makes the performance of some operations comparatively easy, which in the ordinary state of the system could hardly be done at all. It is not, therefore, to be wondered at that professional men are reluctant to abandon the use of chloroform, and their unwillingness might be excused if there were not a substitute equally efficacious, as easily administered, and entirely safe. That rectified sulphuric ether is such a one, I have no doubt. I have witnessed its effects on several hundred patients upon whom severe surgical operations were performed, and all of them were rendered motionless, unconscious and insensible. In no instance was there any alarming or serious consequence. It does not act as speedily, perhaps, as chloroform, but in no case were more than eight minutes required to produce complete anæsthesia. It can be effected in much less time when atmospheric air is not allowed to mix freely with the vapor of the ether. This is the method pursued in the hospital at Naples, where no other anæsthetic agent is used; and I saw a patient undergo a severe surgical operation there without the slightest suffering, who was brought into this state by inhaling ether only a minute and a third! But when administered thus rapidly, it is apt to produce a distressing cough and sense of suffocation for a moment, and there might be some reason to fear asphyxia from the exclusion to too great an extent of atmospheric air. Professor Polasciano, however, told me that he always gave it in this way, and had never seen any more troublesome symptoms than those I had witnessed in the case just alluded to. These, though distressing to the patient, were of short continuance, and by no means alarming.

There is no doubt in my mind that sulphuric ether should be used as an anæsthetic agent to the entire exclusion of chloroform. It is as efficacious, and I should say without hesitation, after having seen chloroform administered by others in many cases, that ether produces a more complete state of unconscious insensibility. Its effects pass off sooner, and less vomiting, nausea and headache follow its inhalation. It is as easily administered. All that is required for its administration is a bell-shaped sponge with a concavity large enough to cover the nose and mouth. If the patient breathes it gradually, little or no irritation is produced in the larynx and air-passages, there is but little if any cough or sense of suffocation, nor a distressing or unpleasant symptom of any kind.

There may be some persons to whom the odor of ether is offensive and irritating, but they are comparatively few, and even they can be brought under its influence without any very great annoyance.

The quantity of sulphuric ether required to produce anæsthesia depends very much on the manner in which it is administered. If the patient is made to inhale it rapidly, and the atmospheric air is to a great extent excluded, a small amount will be sufficient. From four to eight ounces may be regarded as the average quantity. It is rare to meet with a case in which less than four ounces will be used ; and in protracted operations, in which it is desirable to keep up the state of insensibility for a length of time, I have often given more than eight ounces. The ether should at first be poured on the concave part of the sponge ; one or two ounces will be enough for this purpose. When the inhalation is going on, it is better to pour the ether on the outside of the sponge so as to avoid the necessity of removing it from the face. From half an ounce to an ounce should be used at a time in this way, till anæsthesia is produced. When this takes place, the patient is wholly unconscious, and has no control over the voluntary muscles. He is unable to raise his eyelids when told to do so, and gives no indication of hearing or consciousness, if spoken to in a loud tone. The pulse usually becomes slower than the ordinary standard, though at the beginning of the inhalation it is quicker.

It is, I am confident, a perfectly safe anæsthetic agent. I have not been able to find any well-attested case of death from its inhalation. There may have been such, but they have never come to my knowledge, though I have taken unwearied pains to obtain information on this point.

It has been said, that this may be attributed to the fact that ether is not extensively used, but that if it were, there would probably have been as many fatal cases in proportion from it, as from the inhalation of chloroform. But this statement is not strictly correct; for though ether is not employed as an anæsthetic agent to any extent, if at all, in Great Britain or many parts of Europe, it is used in Lyons, Naples, and is almost the only one that is administered in the principal hospitals of the United States of America, where its now familiar properties were first discovered.

I have given it in several hundred cases, and witnessed its exhibition by others in as many more. I have administered it to infants not three weeks old, and to persons more than threescore years and ten, and have never in a single instance seen an alarming or distressing effect produced by it. On the first introduction of ether into surgical practice, it was not thought safe to allow persons to inhale it in whom there was reason to believe there was any disease of the heart or lungs, or who had any tendency to an affection of the brain and nervous system. But for some years past I have been in the habit of administering it to individuals of this description, and have as yet had no cause to regret it. In such cases I have thought it prudent to have the vapor of the ether inhaled more slowly, so that it may be more diluted with atmospheric air than under ordinary circumstances; of course the patient could not be brought as soon under its influence as when taken in the usual way.

The state of the system which is produced by the inhalation of ether is that of narcotism, similar precisely to what is induced by drinking immoderately wine or other alcoholic liquors. It is a state of intoxication more transient and less dangerous than that from alcohol. Its effects pass off sooner, because the vapor of the ether begins to escape from the lungs as soon as the patient ceases to inhale it; while alcohol taken into the stomach is carried into the circulation, and mixes with the blood, and in this way acts longer, if not more powerfully on the brain, though its narcotic effect is not so soon produced. It is possible that life might be destroyed by the inhalation of ether, if it be continued uninteruptedly for a great length of time and a great quantity inhaled. Fatal congestion of the brain might thus be produced, as sometimes happens when alcoholic liquor has been taken to excess. But no person of ordinary prudence would administer it in this way. Long before the occurrence of such a result, symptoms of an unequivocal character would indicate the approaching danger.

When death follows the inhalation of chloroform, on the other hand, there is no merciful premonition. The late Dr. Snow, whose experience on the subject was perhaps greater than that of any other person, thought that "*sudden palsy of the heart* is the cause of sudden death from chloroform." In death by asphyxia, the heart beats for some minutes after breathing has ceased; "whereas in some cases of death by chloroform, the breathing has been proved to go on up to the time the pulse stopped and after it."

With the hope that those who may have occasion to employ any anæsthetic agent will at least make a fair trial of *rectified sulphuric ether*, I respectfully submit these remarks to my professional brethren.

[*Brit. and For. Med. & Chir. Review.*

## ARTICLE XVIII.

### *Extirpation of the entire Lower Lip; of the Glandulæ Submaxillares and Sublinguallis; Resection of the Rami Horizontales of the Lower Maxilla, for Cancer—Cheiloplasty.*

By A. G. Walter, M. D., of Pittsburg, Pa.

Nicholas Huebner, a German laborer, 63 years of age, of good constitution and youthful activity, entered my hospital on April 14th, 1859, with extensive ulceration of the lower lip, suffering excessive pain.

Being loathsome to himself and friends, he had attempted suicide, some two weeks ago, by jumping into the river, but was rescued.

The history of the case is as follows: Six months ago a wart appeared on the left angle of the mouth, which soon assumed the character of fungus granulation, spreading over the whole lip, beyond and above the angles of the mouth and over the chin. The remnant of the lip was everted, while the fungus was very prominent, covered with offensive bloody matter, and excavated in the middle, leaving the periosteum of the aveolar process, and the incisor and canine teeth of the lower jaw exposed. There was then no enlargement of the submaxillary and sublingual glands, but great pain in the diseased parts, with irritative fever. His constitution, otherwise excellent, began to feel the inroads of the cancerous infection. Relief was offered him by removal of the diseased mass, to which he willingly assented.

Assisted by several medical friends, the paient being fully etherized, the carcinomatous mass was extirpated, by incising first the angles of the mouth into the cheek, to the extent of 1½ inches and circumscribing the fungus by two lateral elliptical cuts, which met some distance below the sympyhsis menti. The flaps of the cheek thus formed, were dissected from the lower jaw, to admit of the passing of a curved trocar behind the inner face of the maxilla, through the canula of which a chain saw was carried, and the symphysis menti obliquely resected on each side, from behind and outward, forward and inward ; 2½ inches of the maxilla was thus removed. The tongue being previously secured by an ansa, its powerful traction was plainly but harmlessly felt. There was arterial bleeding from several vessels, four of which required ligation. The flaps of the cheek meeting readily, without straining, were next approximated, and united by several strong Carlsbad needles and silver wire ; an opening being left at the lower angle of the wound, for the exit of the secreta. The mucous membrane of the mouth was united to the dermis of the new upper lip, as well as to the lower one. There was a space of about an inch between the approximated extremities of the maxilla.

The patient bore the operation well. Brandy and hot coffee restored the circulation to its legitimate standard. Great difficulty of swallowing was present for some days after, the tongue having lost its attachment to the jaw. Phlegm, too, collecting around the pharynx, added greatly to his discomfort, the patient not being able to dislodge it by expectoration. Syringing the mouth at frequent intervals, however, with warm water, alleviated the pharyngeal distress, by washing away the glandular secretions of the mouth. He passed a comfortable night under the influence of an opiate, and was next morning walking about the yard of the hospital. Being sustained by brandy, broths and nocturnal anodynes, his recovery went on uninterruptedly. The difficulty of swallowing gradually subsided, as the detached muscles of the tongue formed adhesions to the newly formed chin.

In five days the wound had united by first intention, all pins being removed, as well as the ansa from the tongue, by which it was secured to the cheek ; the lower angle of the wound still discharging some matter, and the secreta of the mouth.

In thirteen days from the date of the operation, the patient left the hospital, apparently in better health, and with more strength than when he entered. A month later, a piece of bone, from the resected maxilla, was exfoliated, the fistula below the chin having healed.

Three months after, he presented himself again in excellent health, yet complaining of the appearance of a hard, movable tumor, of the size of a marble, under the lower jaw, in the mesian line, and with slight enlargement of both maxillary glands. The former rapidly increased to near the larynx, and upward, the superincumbent skin becoming incorporated, assumed a purplish hue, and was perforated by several fistulæ, with soft yellow, fungous bottom, discharging offensive matter. Return of pain, too, augmented his anxiety. The submaxillary glands gradually enlarged, the tumor of the chin being the size of a hen's egg. The resected ends of the maxilla had nearly met in the median line. His powers of mastication were perfect. Such being the condition of the patient, relief was again attempted, though the chances of success were rather slender.

On July 5th, under the influence of ether, the lower lip was divided in the median line, and the diseased mass circumscribed far beyond its outlines, by two elliptical incisions, meeting at the pomum adami of the larynx. The lateral flaps of the cheek were again separated from the maxilla, which was divided by a chain saw, one inch anteriorly of the angle of the lower jaw, at each side. The mucous membrane of the mouth next being dissected from the rami of the jaw, the whole mass was extirpated from one side to the other, down to the root of the tongue and larynx, leaving the somewhat enlarged sublingual gland intact. Both submaxillary glands were next removed, by careful dissection. The bleeding was rather active, several large arteries, and many smaller branches requiring ligation. The tongue, though secured by an ansa, did not retract. The lower lip again was closed by several Carlsbad sutures, and, the patient being weak, the extirpation of the sublingual gland, and the closure of the wound was deferred to the next day, a linseed poultice covering the wound.

Brandy, broths, and hot coffee having again sufficiently revived the vital powers, the sublingual gland was carefully extirpated, the lingual artery having been tied. The large wound left in the neck, had to be closed by transplantation. By cutting from the middle of the margin of the wound on each side outward, and curving upward to about an inch anteriorly below the lobe of the ear, and dissecting the flaps. Sufficient cutis was obtained by elongation to close half of the gap of the neck, in the median line, by Carlsbad needles. Two similar incisions, with their cornua down the sides of the neck, detached two flaps, which, on stretching, were carried in front and secured by sutures, thus closing the wound completely. The denuded portions of the sides of the face and neck were left bare, a cataplasma covering the whole; the chin being approximated to the breast, and confined in this position.

The patient arose from the operating table with no evident mark of exhaustion. Strange as it may appear, no untoward reaction followed. An opiate procured rest at night; brandy and beef tea soon restored him; ptyalism, so troublesome after the first operation, was wanting; deglutition not being impeded. The wound healed rapidly by first intention, only a small opening remaining at the root of the tongue; the side wounds of the face and neck closing by granulation and cicatrization. The patient left his bed daily, and had gained strength enough in three weeks to leave the hospital, the wounds being closed, with the exception of a small opening below the tongue. Remarkably displayed, in this instance, was the rapidity of plastic adhesion. The patient presented himself frequently, is still well, and entertains strong hopes of having conquered his enemy. The deformity of the face, as seen by the accompanying sketch, is trifling, and the power of deglutition and speech unimpaired, the loss of the submaxillary and sublingual glands not being felt.

There being no part of the human body which bears the inroads of bold surgery with greater, or even equal impunity than the face, an instructive lesson is thus given to the surgeon, encouraging him to extend his incisions still *further* beyond the diseased tissues than is usual, for experience has amply proved that the return of cancerous diseases, and all those of a malignant character, stands in direct proportion, not only to the *delay* of the operation, but more frequently to the *parsimoniousness* with which contiguous structures are saved, for fear of extensive mutilation. In case of cancer of the foot, it not being prudent and safe to amputate the leg, but the femur ; so in operations on the face for malignant diseases, the incisions, excisions and resections must reach *far, far* beyond the diseased outlines.

How long the patient may remain free from a return of his disease is doubtful ; still there is hope that success may remain perfect, as nearly five months have elapsed since the second operation. But even if failure, at a future day, should mar the pleasure of our efforts at relief, the interest in the progress of the present case is not lessened in the least, as the power of endurance and recuperation of the system, far exceeding what reasonably could have been expected in a patient so advanced in years, have been plainly and most strikingly portrayed.

[*Med. Surg. Reporter.*

## ARTICLE XIX.

### *Submucous Injection as a Cure for the Toothache of Pregnancy.* By HORATIO R. STORER, M. D.

IN a paper read before the society for medical observation in February last,* it was suggested that in certain obstetric cases, otherwise incurable, permanent relief might be had by a modification of the simple and easy process of Alexander Wood. As the remarks referred to were but incidentally made, in connection with a case illustrative of criminal abortion, and as the proposal itself seems to have been new to the profession, it may be worth repeating in more distinct form, and at greater length.

"Pains in the teeth," says Montgomery, "are with some the invariable accompaniment of pregnancy."† "Their effects upon the comfort and well being of the patient are often very distressing."‡ "After all our endeavors, we shall find ourselves in many instances unsuccessful," "and if not relieved, abortion may result.§

Not to enumerate the long list of remedies that have hitherto been advised for the malady, it is only necessary to state that in certain obstinate cases they are all found unavailing, and that general practice and many writers have been in favor of proceeding to the extraction of a tooth; if which fail, some have been rash enough to counsel the deliberate induction of abortion. These acts however, must be pronounced unjustifiable, both on moral and legal grounds, which I have elsewhere adverted to.‖

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*American Journal of the Medical Sciences, April, 1859, p. 314, copied by Atlanta Medical and Surgical Journal, &c.

†Signs and Symptoms of Pregnancy, 2d edit., p. 283.

‡Churchill, Diseases of Females, p. 338.

§Ibid., pp. 339, 340; Campbell, Midwifery, p. 519; Capuron, Mal. des Femmes, p. 357.

‖North American Med. Chir. Review, May, 1859, p. 459; July, 1859, p. 657.

The toothache of pregnancy, as such, is not dependent upon caries, and if for scientific reasons alone it should not be submitted to the usual treatment. Decay may undoubtedly exist, and in pregnancy caries of the teeth often does progress much more rapidly than at other times, but the affection we are now considering being purely sympathetic and reflex in its nature, dependent directly upon the uterine irritation, can seldom be relieved by the extraction of the tooth, whether this be sound or impaired.

Burns, Blundell and others acknowledge that extraction of a tooth during pregnancy may be immediately followed by abortion—a consequence that might readily be expected from so profound an impression upon a nerve just then in unnatural and excessive sympathy with the uterus; in much the same manner as abortion sometimes occurs in consequence of intentional excitation of the mammæ, whose system of nerve is now allowed to be in intimate connection with the uterine. Be this as it may, however, from the fact of the occurrence and its risk—that abortion may ensue and frequently has ensued directly in consequence of the extraction of a tooth during pregnancy—we are compelled to assert that this very unscientific operation should always be avoided. To the argument that the pain, if unrelieved, might of itself occasion miscarriage, we should answer, even if we had no alternative to propose, that at times this neuralgic pain has suddenly and spontaneously ceased without interference, and that at others, however severely abortion may have threatened, it yet has not occurred.

But if the extraction of a tooth is to be reprehended in such cases; much more is the intentional extraction of the fœtus. The growth and moral tone of society, and the best interests of the profession, have already suffered too much at the hands of rash and meddlesome practitioners, who have thus abetted, however unintentionally, the spread of criminal abortion. We are plain in our statement, but unhesitating, for we believe that in much of the treatment of the nervous complications of pregnancy, whether evidenced by vomiting, convulsions, mania or simply toothache, there is oftentimes on the part of the attendant a carelessness resulting in direct intra-uterine murder—and that by the influence of such example upon the moral sense of the community, the frequency of the intentional crime is increased. The remark we have now made applies with equal force to much also of the usual treatment of difficult childbirth—to recklessness, by what authorties and however defended, in the use of the crotchet, the plug and of ergot.

In considering the real character and cause of the toothache of pregnancy, it occurred to my mind that the operation which has of late been found so effectual in removing neuralgic pains from other portions of the body, would probably prove equally valuable when applied to the gums, and in practice I have found it perfectly successful for this purpose.

CASE.—A. Z., aged 22, applied to me for treatment early in May last. Patient had suffered for several weeks from severe neuralgic pain throughout the left half of the upper jaw, at times lancinating in its character, at others more dull, but never wholly absent. The general health was decidedly affected, as evidenced by the state of the circulatory, digestive and nervous systems. The teeth on inspection, were all sound; there was no heat or swelling of the gums, no tenderness or increase of pain on pressing them.

Anodynes, both local and general, refrigerants, em[illegible]ent poultices, and counter-irritants were successively esorted to, without benefit. After much solicitation, a tooth was extracted; the patient remained unrelieved. On the following day, no change for the better having occurred, ten drops of the Edinburgh solution of the bimeconate of morphia were injected beneath the mucous membrane of the gum; the pain ceased instantaneously, and from that moment to the present, a period of nearly five months, there has been no return of the malady.

Should the operation prove insufficient entirely to arrest the pain, I should advise a direct attempt upon the organ causing the disturbance, by local applications to the cervix uteri. These do not seem to have been resorted to for this special purpose, but from the tincture of iodine we might expect the same benefit as in the vomiting of pregnancy; cases of which have lately been reported in this Journal by Dr. Miller, of Dorchester, the treatment referred to not being original with himself. Too much caution, however, cannot be used in meddling with the uterus during pregnancy; the employment of the speculum, often enough to be condemned at other times, usually becomes here doubly unjustifiable.

I am not aware that any writer has hitherto proposed to prevent, by submucous injection, the extraction of teeth during pregnancy—and thereby to prevent abortion, resulting either from that operation or from the neuralgic pain; not even does the induction of mere local anæsthesia, by any of the numberless modes attempted, seem to have been thought of for this special purpose. Nor do I know that submucous injection had ever been made use of previously to the case I have related, for the cure of dental neuralgia. It was the opinion of a friend, Dr. Page, at the meeting of the society to which the subject was originally presented, that upon this point I was in error; but the gentleman has subsequently informed me that the application in the cases to which he alluded, in the practice of a distinguished dentist, was of anodynes externally, to the surface of the gum. Apparently the only instances as yet recorded of the injection of opiates into the substance of the gum, are by a dentist of Edinburgh, Mr. Smith;* and the operation with him was for the purpose of producing temporary local anæsthesia during the extraction of teeth, not for the purpose of preventing their extraction by the cure of neuralgia.

By the copying of a large portion of my former paper into a leading journal of American dentistry,* an unexpected opportunity has been given of impressing upon dentists the heavy responsibilities, hitherto generally unacknowledged by them, that attach to the extraction of teeth from pregnant women; and I cannot but hope that the views expressed may thus be made productive of decided and extensive good.

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* Edinburgh Medical Journal, November, 1858, p 424

[*Boston Med. and Sur. Jour.*

## ARTICLE XX.

### *Remarkable Case of Adipocere.*

AT a meeting of the New York Pathological Society, held Sept. 14th, Dr. Dalton presented a body which had undergone complete transformation into adipocere. As far as could be ascertained, the body was buried in 1832. It was found in a cemetery, or rather in a pit, in the upper part of the city, which was dug out for the reception of cholera patients. The bodies were placed in separate coffins, but not in separate graves. The coffin containing this body was found about twenty feet beneath the surface; underneath it were three tiers of coffins, and above it nine or ten. The uppermost tier of coffins was covered by three or four feet of solid earth. The soil directly under the coffin in which the body was found was very watery; above this level there was but little water, although the ground was very moist. The bones of the bodies contained in this pit, and in some cases the tendons, were melted together in a semi-fluid mass, the usual result of decomposition under ordinary circumstances.

At the water-mark there were several bodies converted into this adipocere. The specimen presented, however, was the most perfect. The hands and feet have been rattled off during transportation. When the body was first taken out, its color was almost precisely the same as now, (a dullish-white ;) if anything, it has become a little more brownish. It has now been exposed to the air for three months. Its consistency was decidedly less when first removed ; it was then like cheese of medium consistency, a mixture of the ductile and the brittle. In handling it great care had to be used. At that time it exhaled a tolerably strong odor, partly cheesy, ammoniacal, and earthy. Since that time the cheesy and the earthy odors have disappeared ; the ammoniacal smell, however, is still preceptible. In other respects it appears not to be altered in the least, and Dr. Dalton presumes it will remain in the same condition for years, for centuries, if properly taken care of.

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*Dental Cosmos (new series of Dental News-Letter,) August, 1859, p. 53.

The body is that of a large, fat woman, between 45 and 50 years of age, evidently a woman past the prime of life. The anterior parietes have sunk very much, particularly those of the abdomen, which appear to be in contact with the spinal column. The anterior portion of the chest is also collapsed. The change of animal tissue to the adipocere is absolutely complete in all the tissues, except the hair, nails and bones. The papillæ of the skin can be distinguished, but the other tissues cannot be made out.

The substance of which this mass is composed is known by the name of adipocere, or, as the French call it, "*graisse de cadavre*," (fat of dead bodies.) It is exceedingly light, so that one can easily raise the whole subject.

It is somewhat curious that all the bodies, which are reported as having undergone this degeneration, have been interred under precisely the same circumstances. The first case was observed in a similar pit at a cemetery in Paris.

The chemical composition of the substance is such that it is regarded as an ammoniacal soap, sometimes soap composed of ammonia and lime, in other instances almost exclusively a lime-soap. Orfila and Fourcroy, who had paid particular attention to this subject, assert that at first it is almost exclusively ammoniacal, the ammonia being supplied by the decomposition of the nitrogenized muscular tissue. This unites with the fat coming from the adipose tissue, which has become rancid, and produces an ammoniacal soap. Some French chemists regard it as a transformation of the muscles into oleic acid, so that adipocere may be produced by simple decomposition of the muscular tissue. The more generally received opinion is that it is simple decomposition of the muscular tissue into ammonia, which unites with the fat of the adipose tissue. This opinion is favored by the fact, that in almost every instance of this kind the bodies are those of extremely fat persons. Such was the fact in a case, the only case of the kind which Dr. Dalton has previously seen, where the body was that of an enormously fat man. Another reason which makes it probable that the fat must come from the adipose tissue is that, as Orfila ascertained, adipocere does not take place when the animal matter consists of muscular tissue only.

A body buried by *itself* will rarely be converted into adipocere, because the ammonia-compounds produced by the decomposition of the muscular substance are dissolved in the fluids of the body, and these fluids absorbed by the soil, and do not unite with the fat so as to form adipocere. But if a body is surrounded by other bodies, the bodies above, decomposing, produce ammoniacal fluids. These being washed down by the rain, filter through to the ninth or tenth coffin, the water of course in its descent becoming more and more loaded with ammonia, and this uniting with the fat of the lowermost bodies, produces adipocere. The bodies under the surface of the water do not undergo the transformation, probably because this substance is soluble in water.

This material, of which the body is composed, is very inflammable. A piece put on charcoal, placed before the flame of the blow-pipe, takes fire and is consumed readily, leaving scarcely any appreciable residue.

[*Phil. Med. and Surg. Reporter.*

# EDITORIAL DEPARTMENT.

*Salutatory.*—With the present number commences the twentieth volume of the American Journal of Dental Science. Like all other periodicals which depend upon a special class for support, it has been compelled to struggle long and earnestly, not for profit but for existence. The oldest dental journal in the world, it was brought out at a time when the profession was smaller in numbers and feebler in every respect than it is at present. The line between the charlatan and the scientific practitioner was less sharply drawn, and the whole status of the profession was much below what it is at present. Under these circumstances, such a journal was a rather desperate undertaking, and our readers will not be surprised to learn that for years this publication was a constant source of loss to its proprietors. It did not pay its own expenses, and these had of course to be borne by those who had made up their minds to support the enterprize. It was no small burden but it was cheerfully borne, and year after year, the cash account was balanced by contributions from the pockets of those who were laboring to elevate the standard of the profession by the most effectual of all means, a periodical literature.

It is a source of gratification to be able to inform our readers and subscribers, that these strnggles are now at an end. We commence the new volume under most favorable auspices, with a very gratifying subscription list and a satisfactory state of accounts. The Journal is no longer an experiment, but a fixed institution. Its efforts have been appreciated by the profession generally, and they have rendered it a cordial and efficient support, for which we would tender our thanks did we not feel that it is quite as much their own affair as ours.

We have endeavored, to the extent of our abilities, to make the Journal worthy of the profession to which it is addressed, and we flatter ourselves that it has not been the least of the agencies which have effected the change for the better in the intellectual and professional character of dentistry. We say this not in the spirit of boasting, for we are well aware of our own imperfections. One of the greatest drawbacks under which we labor is the difficulty of procuring original articles of merit. There seems to be a strange unwillingness on the part of our ablest men to give to the public the results of their observation and experience. To what cause we must attribute this singular reluctance we are unable to say, but that it exists, the whole profession is as well aware as we.

Nevertheless, under all these disadvantages, we feel that we have presented the profession with many valuable papers, and kept them *au courant* with the scientific progress of the age. We have endeavored, as in a mirror, faithfully to reflect the form and body of the times, with what success it is for our readers to determine. We promise then, not to relax our exertions, but to continue pursuing on towards our ideal of perfection in a journal. We have made arrangements for the coming year which we trust will show themselves in a marked improvement in our original and selected departments. We shall continue to give the latest improvements in science, and in art pertaining to dentistry, and ask the intellectual as well as the pecuniary aid of our friends.

*Longevity.*—Nothing so conduces to long life as comfortable external circumstances, which relieve the mind from those eating cares that so wear away the nervous system. Hence clergymen, who, though compelled to struggle to keep up appearances, are generally raised above actual want, are remarkable for their longevity. The most striking instance we have recently seen of the truth of this observation, is to be found in a recent number of Household Words, which informs us that, of a score or so of British Peers who have died since the commencement of the year, there were sixteen whose united ages amounted to no less than 1,229 years, giving an average of seventy-six-and-a-half years for each. A practical comment this upon the advantages of comfort.

*Wourara in Tetanus.*—Years ago, when Mr. Waterton, the South American traveler, known to all children as the man that rode the alligator, was busy in hunting up the wonders of Guiana, much interest was excited in the peculiar poison with which the aborigines of that region tipped their arrows. All the journals, scientific and literary, rung with the wonders of wourali, as it was then called. Its deadly and rapid operation, and its peculiar paralyzing influence upon the spinal cord were observed and commented on. Cases of tetanus in the lower animals were treated with this poison, and its power as an antidote, were fully recognized by the eminent British surgeons who made the observations.

As is often the case with new agents, often attracting great attention for a while, is gradually faded from the notice of the profession, and little or nothing was said of it, except some general remarks upon its activity as a poison. Of late, the interest in the subject has been revived in consequence of the repetition of the old experiments by the French physiologists and surgeons.

It has been proposed to use it in the treatment of tetanus, and several cases have been so treated both in Great Britain and on the continent. Three cases of chronic tetanus have been reported as getting well, after the administration of the poison. The acute cases, however, have all proved fatal. In the last case, under the care of Mr. Follin, of the Hospital Necker, at

Paris, considerable quantities of a solution of the poison were injected into the cellular tissue every half hour. The result was slightly to relax the spasm of the nerve seter muscles, but nothing more. It has now been proposed to use the alkaloid *curaina*, which is the active principle of the poison, in the hope of having a more energetic and more manageable poison. Whatever is done in this direction, it will probably be necessary to push the poisoning to the very verge of dissolution, and trust to the chances of restoring the sinking vitality by the employment of artificial respiration.

*Crania.*—The faculty of the Baltimore College have recently imported from Paris some beautifully prepared crania, which are intended for the purpose of assisting the student in the study of first and second dentition. The collection numbers nearly thirty entire heads, of which a few are still to arrive, ranging from the third month of intra-uterine life to the completion of second dentition. These are prepared in such a manner as to enable one to study the physiological acts relating to the situation and growth of the teeth to great advantage. In this connection we may remark that, while the museum of the college is well supplied with many interesting specimens—anatomical, physiological, and pathological, with numerous maps, plates, drawings, etc.,—acquisitions are made whenever found to be conducive to the wants of instruction.

*The Profession in England.*—Two schools of instruction for dental students are now in operation in England—one under the patronage of the Odontological Society and the other under that of the College of Dentists. This substantial proof of progress is most agreeable intelligence in this country; but, on the other hand, we are sorry to learn that internecine controversies are raging with great virulence. The differences between the Odontological Society and the College of Dentists, leading to crimination and recrimination of the most unpleasant character, of which the evidences are to be found in the recent numbers of the English dental periodicals, are greatly to be deplored as delaying the legitimate advance of the profession. Another source of trouble exists in the somewhat doubtful position of the profession in relation to the other branches of medicine. The medical commission, under the late "medical act," have brought suit against several persons for the use or abuse of the word *surgeon* in the title "Dental Surgeon," or "Surgeon Dentist," and it has been determined that, as *surgeon* implies some desire or ability on the part of the surgeon dentist to practice in some measure as surgeons, thereby deceiving the public, no dentist is to be permitted to use that word unless duly authorized by the College of Surgeons and registered according to the provisions of the medical act. Since these cases have occurred, the legislature has made provision for the dentist, ranking him after practitioners of midwifery. It is to be hoped that some measures will soon be taken by which an institution may be founded for the purpose of giving dental instruction, with the ability to confer a legal degree, entirely independent of any other specialty, on the English dental student. In this country the juridicial machinery of medicine in all of its branches is much more simple and satisfactory than in England. With one degree, which is an assurance to the public of so much professional instruction, we are killed or cured. We die as contentedly under the hands of a full doctor as we would under the feeble excuse that might be urged if our attendant were only licentiate or M. R. C. S.; and when we are cured, which is an event, we apprehend, as proportionably frequent in this country as any other, we are as grateful as the nature of the case requires. So our doctor of dental surgery is as much and as legally a doctor as if he were to receive degrees from every college in Europe. It has been apparently impossible for our English friends, with that ludicrous air of superiority which is so common, to appreciate the fact that we can give degrees in any thing. This by the way, and as an illustration, we recently had occasion to observe the studious care with which a medical man of this country was eased of his title in some remarks appended to an article which he had communicated to a scientific journal of London. This was the more striking as the letters M. D. were plainly visible at the head of the article.

* * *

*Taft's Operative Dentistry.*—This handsome book, which has now been before the profession for some months, was received just as our last number had issued from the press, and since then ill health has prevented us from reading it, and forming an opinion as to its merits. We have no doubt, however, that the reader will derive advantage from so thorough a study of any branch of his profession as the treatise on operative dentistry before us appears likely to afford.

* * *

*Tomes' Dental Surgery.*—The American edition of this work greatly exceeds the English one in all the externals which have so much to do with one's comfort in reading. The cuts, we believe, are the same as those used in the English edition.

* * *

*Our Contributors.*—We beg to remind our contributors of their recently made engagements. Surely that love for the diffusion of knowledge which, no doubt, animated them to promise communications has not exhausted itself in so short a time.

* * *

*Erratum.*—The author of the article on dental societies has requested us to insert the words "*in Germany*" after the word "learning," in the second note from Hamilton.

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**Plate 1.—Fig. 1.**

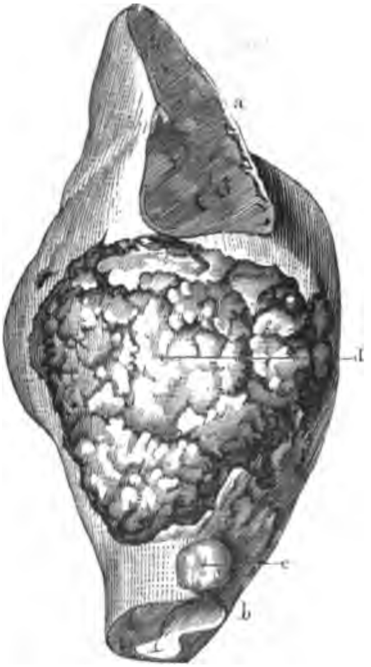
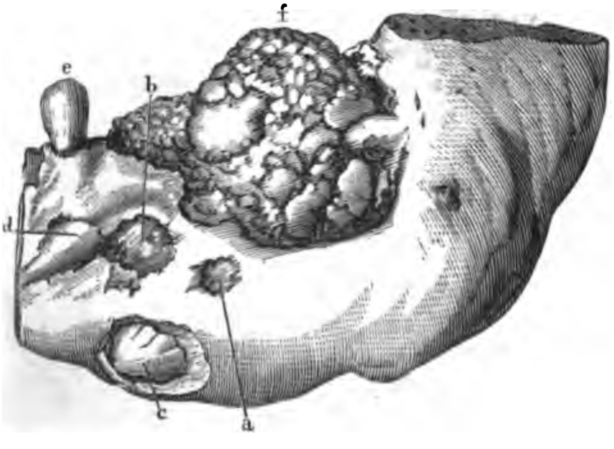


**Fig. 2.**



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# ORIGINAL COMMUNICATIONS.

## ARTICLE I.

*Dental Anomalies, and their Influence in the Production of Diseases of the Maxillary Bones.* By A. M. Forget, M. D. (Translated for the American Journal of Dental Science.)

[Continued from the January Number.]

*Anatomical Examination of the Tumor.*—These remarks would be in incomplete, if to the surgical result which has up to the present moment especially occupied my attention, I did not add the anatomical examination; considered then in reference to the soft parts which surrounds it, it is ovoidal in form, being thirty centimetres around its greatest circumference, and twenty-three around its least. The soft parts adhering to its external face are furrowed by several fistulous canals terminating at the inflamed and ulcerated points of osseous tissue. This is thin, soft and depressible, and is pierced by holes which conduct to the interior of the cyst, and from whence a purulent, thick, viscous liquid, of a reddish color, percolates. A probe introduced by one of these openings is soon arrested by a hard, persistent body, which gives a sound in percussion similar to that of compact tissue denuded of its periosteum. In order to show this body uncovered, I raised the tissue of the gums which formed a kind of operculum at the superior part, thus completing the cyst in which the morbid product was shut up.

This dissection made, the anatomy of the tumor, with a complete revelation of its nature, was revealed. All of that portion of the left side of the inferior maxillary comprised between the ramus of the jaw and the first small molar was found to be converted into a cavity which contained a hard, oval mass, of the size of an egg, having an uneven surface, covered by small tubercles which were invested by a layer of enamel penetrating into the substance of the bone, and easily recognizable by its shining appearance and its peculiar color, (pl. 1, fig. 1.)

Having divided the tumor into two equal parts, it was ascertained that it consisted of homogeneous compact tissue, of the consistence of ivory, and of a grayish-white color. A kind of regular arrangement of the elements which composed it could also be seen by the naked eye, (pl. 1, fig. $1_1$ and pl. 2, fig. 1.) Between the tumor and the osseous parietes of the cyst was a thick membrane, apparently of a fibro-cellular structure; this was free on the side next the tumor, of which it covered the intramaxillary portion, (the part covered by the gums having been removed,) while it was connected to the cyst by filamentous prolongations of a cellulo-vascular character, reaching to the numerous openings on its exterior. The external surface was bathed by a muco-purulent fluid, having a fetid odor similar to that of a carious tooth. At the anterior extremity of the base of the tumor a depression was remarked to which the crown of a molar tooth was attached, wedged in between it and the maxillary bone. This

PLATE 2.—FIG. 1.

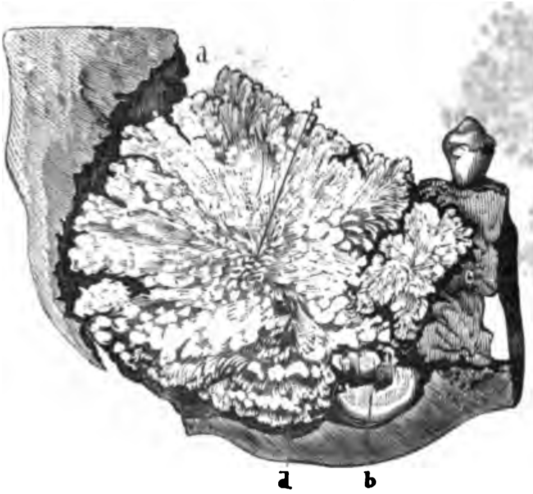
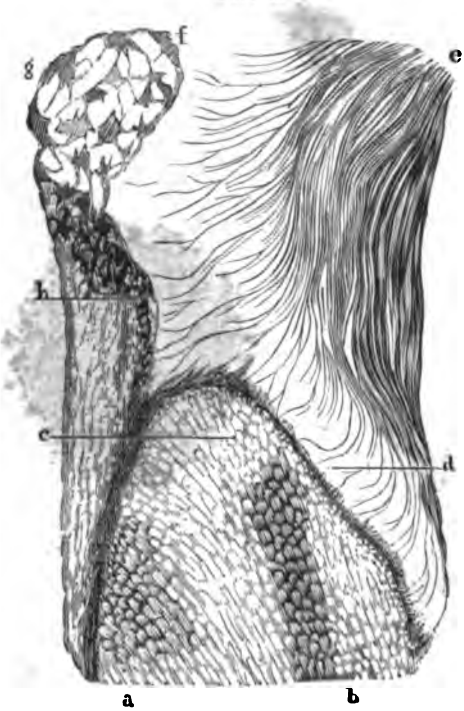


FIG. 2.



arrangement is represented in pl. 2, fig. 1, c, where a portion of the bone has been cut away; in the same plate is shown the second small molar lying obliquely in the substance of the jaw bone, (pl. 1, fig. 2, d,) under the alveolus of the first small molar, e.

Thus we have discovered the situation of all of the teeth with the exception of the two last molars; the alveolar spaces which are intended for them being occupied by the tumor. The question now naturally arises—what has become of them? The explanation that their bulbs were originally compressed by the pathological production, that these atrophied and finally disappeared, leaving no vestige of their existence, is not permissible, in view of the numerous cases which demonstrate the simultaneous development of the teeth and abnormal products in the same maxillary bone. In the analogous cases which I have had occasion to examine, all of the teeth have possessed their ordinary dimensions; although frequently deviating from their normal direction, often far removed from the place they should physiologically occupy, and sometimes enclosed in the substance of the morbid growth, they have yet, nevertheless, always been found. Thus their absence, as due to atrophy and to the re-absorption of their primordial elements, does not seem to me to be founded on a sufficiently demonstrative fact.

As to the present case, it does not appear necessary to invoke the aid of a merely seeming interpretation; for the tumor, studied in its origin, its mode of development, its symptoms, its seat, and above all, in its anatomical characteristics, refutes the idea. The microscope, in short, in this instance, is in agreement with the direct intuition that it is composed of the same substances that form an integral part of the teeth, (pl. 2, fig. 2.) Now, to my mind, this is sufficient to reveal the origin and nature of the tumor; its origin, however, is proved by M. Ch. Robin's investigations which have been textually reproduced in the description of the plates. I do not hesitate to say that while the nutritive juices were forming the two molars in question, according to physiological order, each separately, hypersecretion from morbid influences intervened and the aggregation of immature dental elements took place, thus producing the monstrosity.

If we now proceed from the study of the material characteristics of the disease to the first influences which prepared the way for its invasion and, favored its development, we shall find in the presence of the fibrous membrane which formed a covering for the tumor, an indication which may enable us to fix a point of departure, and also to comprehend the mechanism of its formation.

The membrane in fact, limited to the portion of the tumor contained in the interior of the cyst, or intramaxillary portion, establishes between this and the portion jutting above the osseous or extra-alveolar edges, a decidedly marked line of demarcation. It is simply, according to my views, the exaggerated reproduction of a normal anatomical tendency existing under a form and in very restricted proportions when the evolution of the teeth proceeds regularly. I speak of that membrane which envelops the dental root, designated by most writers under the name of alveolo-dental periosteum, and described with much precision by my learned confrère, M. Oudet, under that of the cortical membrane, because to it is attributed the function of secreting the cortical substance or cement. This membrane is in reality the external layer of the dental follicle, under conditions of aspect, form, structure and vitality produced by disease. Hence, from the morbid activity of the secreting organ, the abnormal formation of ivory and that of the osseous matter or cement, and the regular composition of the dental ostoid, I am enabled to assign an origin to this tumor without exceeding the limits of a severe induction.

I think that there had been :—

1st. An original union of the follicles of the two last molar teeth; whatever cause produced it, so intimate a fusion existed between them that they were one.

2d. That under the same morbid influence, the excess of vitality of the different organic elements of these follicles produced the hypersecretion of the ivory and osseous substances.

3d. That the diffusion and irregular aggregation of these constituted the pathological formation.

4th. And finally, this last, by its development and the volume it acquired, has had the effect of producing the excavation or cyst in the centre of the jaw; at the same time it kept up an inflammation, which, after having disorganized the osseous tissue and greatly altered the structure of the surrounding soft parts, it left no other resource than the operation I subsequently performed. The consecutive result of the operation only confirmed that obtained in the first instance. Two years after the operation the right half of the maxillary bone was found to be depressed backwards and towards the median line. The point of the chin was effaced by the inclination to the right; the inferior dental arch was behind that of the upper jaw, nearly a centimetre: this gradually diminished and became hardly perceptible at the level of the two large molars. This defect in the parallelism between the two jaws almost disappears when the elevator muscles contract with a certain degree of energy, so that mastication is not impaired; it increases, on the other hand, when the jaw is lowered. Perhaps it may also be added, that the mouth being open, the deviation of this bone from right to left determines a similar deviation of the floor of the mouth, of the tongue and of the vault of the palate and its pillars, without impeding the regular performance of their functions. And as to the portion of the left branch of the jaw which remained in the wound, I am assured, that forced by the contractile action of the temporal and external pterygoid muscles, it was carried above and inside the zygomatic arch, where it remained immovably fixed. I proved, moreover, the existence of a band of cicatricial tissue, extending along the track of the incision of the soft parts and uniting the two osseous extremities. This extent of inodular tissue, being endowed with great firmness, offered an important *point d'appui* to the tongue in its different motions. This tissue, in becoming more perfectly organized, re-established the continuity of the bone in a certain rudimentary manner and enabled it to act, with more and more precision and force.

If, in the preceding remarks, I have said that the case is without analogy in science, I have not intended to ignore the existence of various anomalies of nutrition and dental development which have been described, nor the histological relations that exist between these and the anatomical condition exposed. Numerous and varied as these anomalies are, for the most part, being constituted by the lateral and most frequently by the partial union of two or more contiguous teeth they do not affect them in form, position or functional aptitude: nor does the maxillary bone which holds them receive any morbid taint. Now the difference between these slight anomalies and those which are distinguished by the complexity and development of the elements which compose them, is easily seen, and at least in a surgical point of view, all serious analogy must be abandoned; I say, in a surgical point of view, because anatomically, the unity of composition and the law of formation of primordial tissues, indicate from an elementary to a complicated fact, a common teratological influence and a necessary affiliation based upon a series of intermediate facts which may be considered as steps by which the organism successively passes from the simple to the complex. From this unitarian doctrine, so learnedly generalized and applied by its illustrious author, Geoffroy Saint Hilaire, to the philosophical study of the dental systems of mammifers and birds, the partial fusion of two or more teeth, either by their crowns or by their roots, may be looked upon as a fit point of departure for the anomaly which I have represented in entirely isolated proportions; they are, so to speak, the first step taken by nature outside of regular physiological development, and a tendency towards the bizarre and truly monstrous case I have brought forward. However, considered either in its initial type or in its more advanced form, this anomaly is not elucidated without duly estimating a primitive morbid state of the odontogenous follicles; since, when deprived of the vascular element, as remarked by Oudet and others, the dental substances are incapable of being the seat of nutritive or pathological operation. Hence it is evident that to give an account of the alterations of structure and form here presented, we must study these in their origin, for thus only do we perceive their connection to the organism under whose laws they exist. Now, whether we consider that anomaly as the result of disease of the follicles, or with Geoffroy Saint Hilaire, as a simple departure from the usual work of physiological growth, the grouping of the dental elements into an amorphous mass in the human species, it will be better understood, if according to the learned author of the theory of analogies, we repeat what takes place at the origin of the evolution of the teeth:—"Each dental rudiment," says the illustrious naturalist, "is surrounded by an exhalent envelop which stimulates the growth of the tooth. And while the latter are isolated, they grow and form teeth in a manner very easily understood; but if two osseous nuclei approach and touch each other during this exhalation of nutritive juices, they unite, crystallizing like true stalactites, and form a compound of several dental elements. In this manner the molar teeth are constituted; and likewise those agglomerations of teeth, which in the elephant and many other ruminants, represent the normal state: this is exceptionally observed in man."

Saint Hilaire had one of those cases in view when he formed the opinion I have quoted; he has given a drawing of this anomaly in his appendix to the dental system of mammifers and birds. It will be observed that there are certain points of analogy between this one and the one mentioned in the preceding remarks.

### *Case II.—Tumor Occupying the Alveoli of the two Bicuspids.*

The subject of this observation was brought before the Society of the Faculty of Medicine, in 1809, by M. Oudet. He complained of the great impediment caused by a tumor in the mouth; it was found to consist of a large mass which had been mistaken for tartar, extending above the dental arch and producing a decided eminence on the side of the cheek. Extraction was performed and then the nature and form of the tumor became appreciable. From M. Oudet's description it appears that it resembled a cone implanted by its apex in the alveolar cavity, its base being in contact with the crowns of the contiguous teeth; it was formed by an aggregation of the dental elements appertaining to the bicuspids, which by their arrangements reproduced the form of the milk incisors and canines.

In this case the pathological influence had also effected an exaggeration of the elementary parts of the bicuspids, and in irregularly associating them between them it had brought them to the condition of a single tooth. Other intramaxillary tumors exist, which are no more due to the original and morbid aggregation of the different dental elements than those with which I have been occupied, but to a secondary hypertrophy of one or more of these elements. The tooth presenting this anomaly of nutrition generally preserves its chief physiological characteristics, and the alveolus, which is its receptacle, is not sensibly modified in its form, as long as the tumors, which are nearly always attached to the dental roots, are confined to a very small compass; thus, for the most part, they are inoffensive. It is when they grow and become large enough to change the conditions of vitality and the appearance of the jaws that these tumors necessitate a resort to urgery.

Such a case was observed by my colleague, M. Maisonneuve, under the following circumstances, which he was kind enough to communicate.

*Case III.—Osseous Intramaxillary Tumor attached to a neighboring tooth. Simultaneous evulsion of this tooth and the Tumor.*

A man aged forty-five years, came from a province to Paris, in order to have a tumor removed from the inside of his mouth, where it was the cause of much distress. This tumor occupied the left side of the lower jaw, and formed a decided protuberance from this in both sides, but particularly so on the outside where it resulted in giving a most unpleasant expression to the face. At the small extremity of the ovoid, represented by the tumor, the incompletely destroyed crown of a carious tooth was visible, but this was partially marked by the elevation of the gum, caused by the morbid growth contained in its alveolus.

Before operating, M. Maisonneuve directed his patient to have the carious tooth removed, thinking thus to open a way by which he might the more easily explore and take away the encysted product. This preliminary operation, however, had an unexpected and decided result, for the tooth, and with it the tumor which was annexed, were removed by the same effort. This last, which was about the size of a large pigeon's egg, was fastened to the tooth by a very narrow pedicle; this being opened along its axis, the line of intersection between it and the root could be determined. Microscopical examination demonstrated that the specimen contained no ivory, but was composed exclusively of osseous tissue.

As to the patient, he was not slow in recovering; it followed, after this double extraction, that the parietes of the alveolus, separated and raised by the tumor, that a slight inflammation visited the internal surface of the cyst which contracting upon itself, finally resulted in its complete shutting up.

Comparative anatomy has proved that morbid productions, analogous to the one which has just preceded, are met with in animals, and especially with the large ruminants. M. Goubaux, Professor in the veterinary school at Alfort, has published examples of some, and I give one below,* which has the double interest of showing at the same time the anomaly of nutrition which causes it and the alteration of the maxillary bone, which was its effect.

*Case IV.—Encysted Osseous Tumor in the Upper Jaw of a Horse.*

This tumor was found on the interior of the alveolus of the upper canine tooth, to which it had contracted no adherance; it was encysted and very irregular in form, and about as large as a hen's egg. A microscopic examination, as in the preceding case, showed it to be composed entirely of osseous or cemental tissue.

I should not omit to say that these morbid growths are all invested by a membranous envelop which is found to be the alveolo-dental periosteum. This membrane secretes the osseous elements constituting, by their aggregation, these intraalveolar tumors, wrongly viewed as dental exostosis; to look at them, in fact, in this point of view, is to give them physiological explanations which properly belong to the osseous system. It is to state that they owe their origin to the tooth itself, whilst in reality they are a substance entirely distinct in itself, and thus owe their formation and growth to organic operations to which the tooth is entirely foreign.

This absence of all original connection between the tooth and these osseous products of accidental formation, is completely proved by the last case, which shows this product as isolated and without any relation of continuity of tissue with the canine of the horse to that with which it was simply brought in juxta-position.

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* I am indebted to the kindness of M. Leblanc, member of the Academy of Medicine, for this specimen.

There is another fact for which I am equally indebted to comparative pathology, and which enables us to appreciate the very considerable degree to which the simultaneous hypertrophy of dental substances is carried, and the gravity of the disorders it creates in the bone where it is observed. This case was communicated by M. Boulay, of the school at Alfort.

### *Case V.—Rare case of Dental Hypertrophy in a Horse.*

The disease occurred in the second grinder of a horse which died of glanders. The animal had a large growth on the right side of the upper jaw, in the middle of which this tooth had, by its unusual development, produced an extended inflammation, characterized by the rarefaction of the osseous tissue, and the enlargement of its spongioles. The tumor was very irregular in form and weighed about one kilogramme. It was caused by simultaneous hypertrophy of the dentine and cement, but chiefly by the hyper-secretion of the last. This substance is deposited in successive layers of unequal thickness on the surface of the tooth, where it forms crimplings or swellings, separated from each other by circular grooves; this arrangement explains how some teeth are fastened to the interior of the jaws, and gives a reason for the impossibility of extracting them without breaking the dental arch which embraces their depressions, or is nicely adapted to their abnormal swellings.

A very interesting peculiarity of this case is the existence of cavities within the tumor, containing fragments of osseous tissue, which are movable. These are manifestly parts of the spongy tissue of the jaw. Microscopic examination leaves no doubt as to the osteo-dentine character of the formation.

We think it unnecessary to prove, that in man, as in animals, it is very rare for the maxillary bone not to become affected by the presence of altered or deformed teeth. This has been observed by M. Boulay, in his remarkable memoir on the diseases of the teeth of herbivorous animals.

I cannot terminate this part of my work, particularly devoted to the study of osseous lesions caused by anomalies of nutrition in the teeth, without adding an example of partial necrosis of one of the intermaxillary bones, produced by the premature growth of two second incisor teeth, in a child three years of age. I am indebted for it to Dr. Géry, Sr.

### *Case VI.—Anomaly of Nutrition in two Second Incisor Teeth in a Child three years of age. Necrosis and Loss of a considerable portion of one of the Intermaxillary Bones.*

This child, having a tumefaction of several weeks growth in the gums of the incisor teeth of the upper jaw, which was painful to the touch, was placed under the care of Dr. Géry, who prescribed lotions with a solution of alum. In a few days the inflammation and swelling subsided. It was then easy to examine the teeth, which were movable, and to discover that a purulent fluid exuded from their alveoli. The teeth fell out spontaneously in a few days, and the existence of voluminous and loose sequestered bone was ascertained. This was easily extracted.

I examined the specimen with the greatest care, and I am satisfied that it consisted of nearly the whole of one of the intermaxillary bones. It presented an unequal, rugose surface, and is creased by numerous vascular canals. The alveoli of the two temporary incisor teeth, and above them, two cavities in the substance of the bone surrounding the permanent incisors, of natural size, may be easily seen. I think, with M. Géry, that the premature evolution of the germs of the second dentition was

**Plate 7.—Fig. 1.**

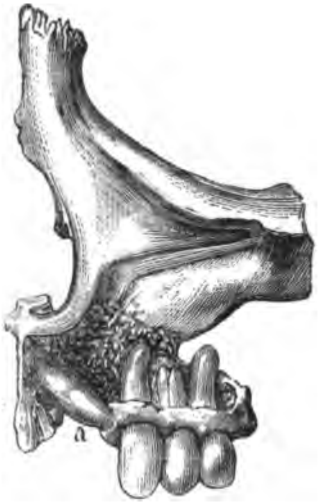
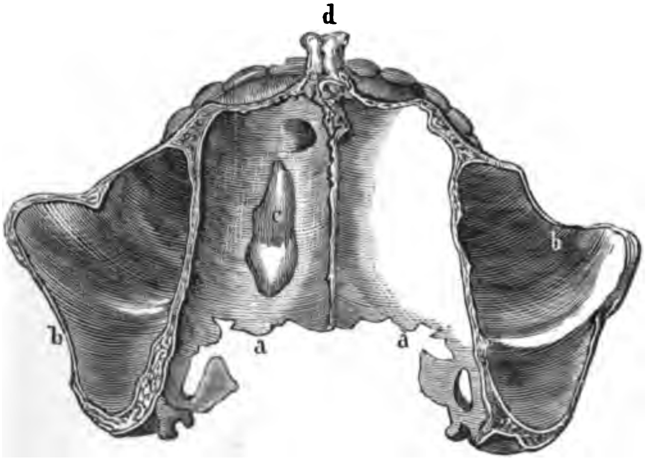


**Fig. 2.**



the cause of the affection. The absence of all proportion between the dimensions of the alveolar arch and the age of the patient and the volume of these teeth abnormally developed, furnish the reason for the ulcerative inflammation which caused the dropping of the milk teeth and the deep seated lesions which compromised the bone itself.*

## CHAPTER SECOND.

### *Anomalies in the Position of the Teeth: their Pathological Consequences.*

In order to achieve the study of the histological relations existing between dental anomalies and the diseases of the jaws, it remains for me to consider the anomalies in the position of the teeth, which, like those of nutrition, already discussed, are the point of departure of a certain number of pathological phenomena.

These anomalies may be divided into two classes. In the first, we have the tooth deviating from its natural position within the limits of the dental arch; in the second, the tooth is found at some point of the jaw, more or less removed from the dental arch. I have given some examples of these in pl. 7, figs. 1 and 2; and pl. 8, figs. 1 and 2. Thus in pl. 7, fig. 1, the teeth occupy their alveoli; while in pl. 8, fig. 2, they are at some distance from them; the supplementary canine tooth, particularly, may be observed encased horizontally in the floor of the nasal fossæ.

We find in the *Bulletins de la Société Anatomique*† an example of a superior incisor tooth received into an accidental cavity, made between the two upper maxillary bones. This cavity resembled a median maxillary sinus, seven or eight lines in diameter. The report does not state whether this morbid condition was revealed by exterior signs; but it is easy to comprehend that so serious a development should eventually require the surgeon. It is true that these anomalies are sometimes unsuspected during the life of the subject affected, manifesting such weak objective signs as hardly to be considered as pathological phenomena. Most of them, however, are a cause of incessant irritation, causing caries of the regular teeth, caries of the alveolar border, and fistulous abscesses. See pl. 8, figs. 1 and 2.* In some instances the only indication of the existence of these anomalies is to be found in the persistence of dental neuralgia, so acute as to result fatally. See the case reported by Dr. A. Desirabode in the *Journal des Connaisances Médico-Chirurgicales.*†

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* This case, it seems to me, settles the question now before the Academy of Sciences, as to the existence of the intramaxillary bone: according to M. Rosseau, who has found a sincere opponent in Dr. Larcher, this bone does not exist. The above observation proves the correctness of Dr. L's position.

† Tome 11, p. 25, obs. by M. Lacroix.

### *Case VII.—Anomaly of Position of a Wisdom Tooth. Acute Neuralgia. Death by Suicide.*

The subject, named Chéron, and a wheelwright by profession, was born at Villefranche, in the year 1816. In 1841 he was taken to the hospital *de la* Pitié, then under Lisfranc. Having been subject for some time to violent toothaches, he precipitated himself from his window. On the day after his entrance, he died from the effects of the fall. At the autopsy the lower left wisdom tooth was found under the much tumefied gum, situated with its crown pressing against the last molar, and its roots corresponding to the base of the coronoid apophysis.

In regard to this case, there appears to be no doubt that the suicide of the subject arose from the exasperation pro-

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* The memoir of Dr. Toirac, in the *Revue Medicale* for 1824, may be profitably consulted in the study of this subject. It is entitled, *Les deviations de la dernière molaire et les accidents qui peuvent accompagner sa sortie.*

† Number for the 1st of September, 1851.

PLATE 8.—FIG. 1.

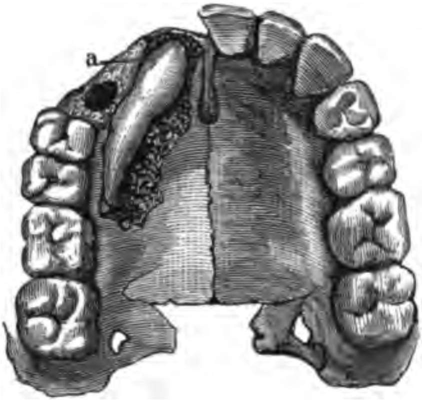
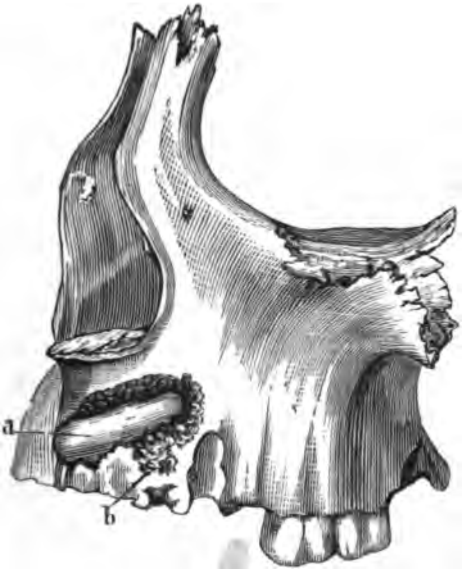


FIG. 2.



duced by the dental pains. The tetanus, also which intervened before death, came from the same cause. I may add further, that the other three wisdom teeth were regularly developed.

I remark above that the teeth sometimes migrate from the alveolar border. I cite, in support of the statement, a case of Prof. Blandin,* wherein it appears that a deviation from the regular position may cause more or less large tumors of the jaws.

### *Case VIII.—Anomaly of Position of two Molar Teeth, Causing a Tumor in the Vault of the Palate. Cancer of the Maxillary Bone suspected. Error of Diagnosis discovered during the Operation.*

A woman, aged forty-three years, entered the hospital Beaujon for a disease dating back eighteen months. It was characterised by fungous ulcerations occupying the nose and right cheek. It presented a tumor of the form and size of a nut, upon the left side of the palatine vault, limited without by the dental arch, and within by the median line, and extending antero-posteriorly from the neighborhood of the canine tooth to the veil of the palate. Struck by carcinomatous aspect of the ulcerations, Blandin formed an unfavorable diagnosis. He decided, in treatment, upon the ablation of the tumor, and the cauterization of the facial ulcer. Having determined, a crucial incision was made upon the tumor, the flaps were dissected back, and the surgeon was already disposed to attack with chisel and mallet, when, having sponged the wound, he perceived *a shining, white body* in the centre of the tumor; upon touching it he perceived that it was movable, and it was extracted. It was a molar tooth with three short roots, but having the form and size of a first large molar.

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* *Des Dents.*

A second tooth was extracted; it was as large as the first, and also multicuspid. "Great was my surprise," says Blandin. These teeth had pierced the internal part of the alveolar border, and lodged between the mucous membrane and the corresponding osseous plate. The wound of the palate was cauterized to staunch the flow of blood, the ulcerations of the face were also several times cauterized, and two months after, the patient, cured, left the hospital.

Were these ulcerations of the face cancerous? Blandin re-affirms it in concluding his report; to him it was a double disease. This view is open to controversy. Indeed so rapid a cure of an ulcerous cancer would appear very rare and improbable.

Be this as it may, the important point of our theory is established by this case; viz. that tumors caused by the aggregation of several teeth removed some distance from their normal place of development, may exist in the substance of the maxillary bone. A tumor, somewhat like the preceding, occupying a part of the lower jaw, remote from the alveolar border, would have been taken away, according to Blandin, by Marjolin and Duval, if he (Blandin) had not pointed out the error in their diagnosis in time. These facts suffice to show how important it is for surgeons not to ignore these migrations or changes in the position of the teeth, in forming diagnoses of tumors in the vicinity of the dental arch.

If, as in Case viii, the turning of the tooth from its regular position by this variety of anomaly only exceptionally constitutes a serious pathological phenomenon, then, when it is removed some distance from the other teeth, it does not oppose their regular evolution; in being removed the case is different from that in which the tooth still preserves its place in the arch, though developed in the vicious attitude entailing changes in its natural relations with the contiguous teeth and the maxillary bone. One may easily perceive that the tooth thus deviating becomes a cause of active and permanent irritation, which may eventuate in lesion more or less grave in character.

### *Case IX.—Anomaly in the Position and in the Development of a Wisdom Tooth. Penetration of one of the Roots into the Dental Canal. Medullary Osteite of the Ramus of the Jaw. Resection and Disarticulation of one of the Condyles.*

The patient, a man, aged twenty-six years, had been affected for some time by very acute dental neuralgia, corresponding with the last molar teeth of the right side of the lower jaw. The tumefaction over the ramus of the jaw gradually increased over the region of the masseter, and finally rendered lowering of the jaw impossible. Hard, irreducible under pressure, the swelling was evidently the result of hyperostosis.

The patient now decided to enter the hospital *de la Pitié*, under the care of M. Maisonneuve, who, after having laid bare the tumor, applied the trepan, in the hope of finding the tooth which he presumed to be the cause of the disease. This operation proving unsuccessful, he resected the bone near the first large molar, and disarticulated the condyle.

The specimen having been sent to me by my honorable colleague, I was able to establish all the characteristics of an osteite from the various degrees of development. Cut along its axis, the branch of the bone presented several cavities in its substance, carpeted by a pyogenic membrane bathed in pus. Some of these cavities were completely closed by osseous tissue, and some opened exteriorly by passages made by the ulceration of the tissue itself. One of these cavities, occupying the condyle of the jaw, opened through the articular cartilage. The development of these encysted abscesses could not have been carried on without producing rarefaction of the areolar tissue of the bone, and the simultaneous swelling of the compact layers; this double action determined the augmentation of the ramus, and the accruing pathological vascularity which was revealed by numerous osseous canaliculi with which its tissue was perforated.

The medullary osteite, of which this specimen is a striking example, terminating by suppuration and elimination of sequestres and splinters from the purulent cavities I have described, effected a less rapid progress at the angle of the jaw where the hypertrophic condensation of the osseous elements exist in considerable proportions. The trepan was here unsuccessfully applied. As to the cause of the disease, I do not hesitate to attribute it to the abnormal growth of the wisdom tooth enclosed in the base of coronoid apophysis, and passing nearly a millimetre over the borders of the alveolus in which it was situated. This, like the dental crown which fills it, has twice the dimensions it should have under ordinary circumstances, and the tooth in leaning against the neck of the adjoining tooth, (the second molar,) displaces it in order to ascend. Hence it is obliged to effect its development in the substance of the bone.

A section of the jaw under the dental canal, demonstrated the existence of a communication between the canal and the alveolus of this wisdom tooth. The roots were far from healthy, their points being truncated and unusually dilated where they projected into the canal; the bluish discoloration also plainly indicated an alteration in structure. Other cases, furthermore, favor my view of the etiology of the preceding.

The first of these, an illustration of which will be found in pl. 6, fig. 1, has been published in my inaugural thesis, but I shall here only give those details that relate particularly to the subject of this work.

### CASE X.—*Osseous Cyst in the substance of the Jaw.—Anomaly in the Development of the Wisdom Tooth.*

Madam D., aged thirty, of strong constitution and enjoying good general health, entered the hospital *de la Pitié*, in the month of April, 1838. She was affected with a swelling on the right side of the jaw, of the size of a large hen egg. It was bounded in front by the second incisor, and behind by the base of the coronoid apophysis. As to the origin and progress of the disease, the patient stated, ten years before, after cleaning her teeth which had always been diseased, she became conscious of a small tumor developing itself near the molars; it gradually increased and occasioned very severe pains, which she attributed to the teeth, some of which fell out.

The extent of the tumor decided Lisfranc to resect that portion of the jaw. The operation was speedily followed by cure, and Madam D. left the hospital six weeks after.

Upon examination the piece removed showed considerable induration of the soft parts about the maxillaries, and under these, of the development of the jaw, in the centre of which was a large cavity filled with a sanious and purulent liquid. This cavity was formed by the two plates of the maxillary bone which were very thin, being in some places reduced to the thickness of the periosteum. Its floor, constituted by the base of the enlarged bone, presented the crown of the wisdom tooth in relief in the cyst. It was pushed horizontally from the base of the coronoid apophysis, solidly enclosed in the calcareous tissue: pl. 6, fig. 1. Its abnormal position and the regular development which it effected in this vicious situation, left no doubt as to the part it had played in the successive production and evolution of the disease of the bone. It followed in short, from the examination, that the wisdom tooth could not grow without exercising the continual pressure against the neighboring tooth, giving rise to the pains of which the patient had spoken: this pressure also occasioned the inflammation of the gums, the caries, the loosening and spontaneous falling out of most of the other teeth.

Two other cases, not less interesting than the last, have been reported to me by my *confrères* MM. Nélaton and Maisonneuve. Though differing as to the nature of the lesion which necessitated the intervention of art, they resemble each other in the original morbid proclivity which had been the point of departure.

### *Case XI.—Cyst in the Ramus of the Lower Jaw, coincident with the presence of a Molar Tooth in its Cavity.*

The patient was a woman aged about thirty years. Her cheek had slowly but progressively tumified from the effects of an abnormal development of the ramus of the jaw. The tumor was accompanied by dull pains. It finally took the form of a nearly regular half sphere. The ampliation of the lower jaw was chiefly effected by the hemispherical raising of the external table, the internal preserving its regular position. M. Nélaton decided with reason to attack the tumor with the bistoury and probe; in this manner the exterior soft parts having been conveniently incised, the external wall of the cyst was circularly resected. This once removed it was easy to explore the cavity, and the result was the discovery of a tooth situated in its lowest part, pl. 4, fig. 4, *b*. The tooth, partially enclosed in the calcareous tissue, was taken out after several trials. The operation was an entire success; for twelve years after the disease had not returned.

The preceding cases it seems to me, are calculated to throw some light on the origin of certain cysts which are frequently found in the substance of the jaw, and which it has been the tendency of recent researches to attribute to the abnormal increase in the natural cavities of the organism; that is to say, to the growth of the dental follicles themselves. This opinion is founded as well upon the consideration of the seat of these tumors, which appear along the dental arch, and at an age corresponding generally to one of the two phases of life characterized by the double work of dentition, as upon the microscopic results which has proved the existence, several times, of an epithelium investing the interior of these cysts, on the roots of the teeth prominent in them.* Now as to the epithelium, does it not indicate that a physiological tissue, serving to invest a normal cavity, must also contribute to the development of the encystic tumors, and in some sort serve as a bases to their definitive constitution. As a partizan, in pathogenesis, of the doctrine of naturalism, which sees but an infraction of a primitive organic type in most morbid growths, I accept this interpretation as it is demonstrated to me by the existence of alveolar cysts in direct communication with the dental follicle.

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* Case by Dr. Dénucé. *Bulletin de la Soc. Anat.*, vol. xxii, p. 806.

The last case I shall cite, supporting this view, is complex; it exhibits two distinct pathological conditions; the primitive or original is that of a dental cyst with an epithelial investment; the other, or consecutive, is that of the inflammation of the lower jaw rendering disarticulation necessary.

### *Case XII.—Dental Cyst. Inflammation of the Lower Jaw Bone.*

A young man aged twenty-seven years, consulted several surgeons of Paris in reference to a swelling of the right side of the lower jaw which had acquired three times its proper dimensions. Nearly all the time tormented by a dental neuralgia, which had announced itself twelve years before, the patient at its first symptoms, had remarked a tumefaction about his molar teeth. The tumor did not make any appreciable progress until after a period of three years, when its evolution was marked by continued, but moderate pains. The body of the jaw on the right side was so deformed as to represent an irregular ovoid with some points in relief; the gums were red, thick and tumefied, bleeding with extreme facility, and the teeth, deviating for the most part from their proper direction, were more or less movable. The submaxillary region presented some engorged lymphatic ganglions. M. Maisonneuve, having charge of the patient, deemed disarticulation necessary; this he performed about the middle of April, 1857, but it was followed eight days after, by the death of the patient, from gangrenous inflammation of the wound and secondary hemorrhage.

The disease in this case, was, during the life of the patient, taken successively for a cyst, a cancer, and finally for an inflammation of the bone.

Subsequent examination determined that the case was one of complex lesion. It revealed a large molar tooth, situated horizontally in a cavity in the centre of the tumor, which had thus viciously placed, regularly developed, pl. 5, fig. 1, and pl. 6, fig. 1. This tooth was surrounded by a fungous growth, which, under the microscope, seemed to be formed of fibrous or fibro-plastic tissue, with an epithelial investment; a condition analogous to that I have above indicated, and which proved that primitively, in this case, there had been disease of a dental follicle. This was the point of departure for the secondary lesion, which progressively extended all along the side of the jaw, characterized, like inflammation of the bone, by ampliation of the interstices of alveolar osseous tissue, and the hypertrophic development of the organic substance in it. This last, by its predominance over the calcareous element, in which it constituted a kind of myeloplastic substance, explains the extreme fragility of the bone which could be broken by the slightest pressure.

The lymphatic ganglions, raised with the tumor to which they were attached, examined under the microscope by M. Broca, presented the characteristics of a simple adenite.

I do not know of any case that presents any points of analogy to the one just described. It justifies the double point of view, in which we have considered the lesion of the bone by which it was effected. Having in two distinct terms, the first of which corresponds to the original inclusion of the tooth, and the second, to the disease of the bone, this lesion naturally presents two pathological states, of which the last was the most serious, requiring a mutilation of the face which might have been avoided by a recognition of the dental cyst.

PLATE 5.—FIG. 1

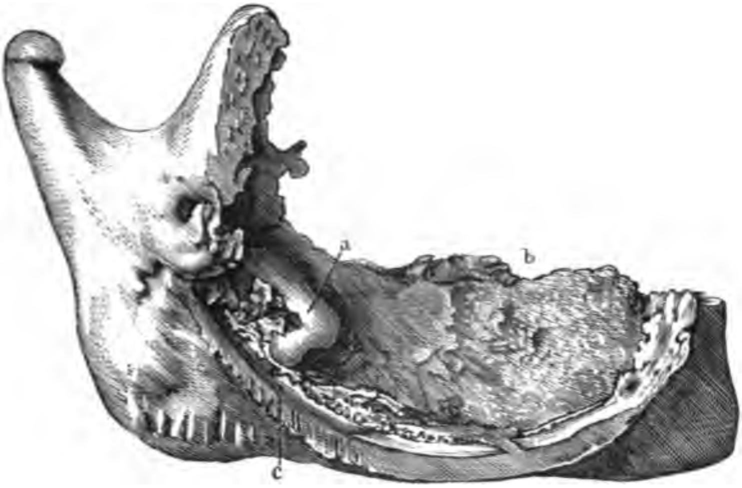


FIG. 2.

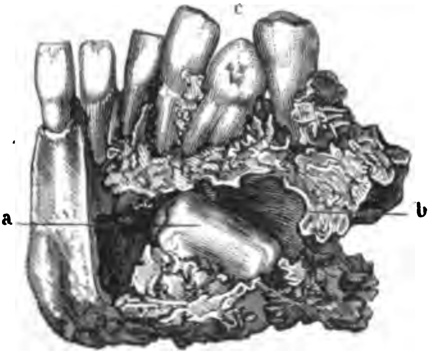
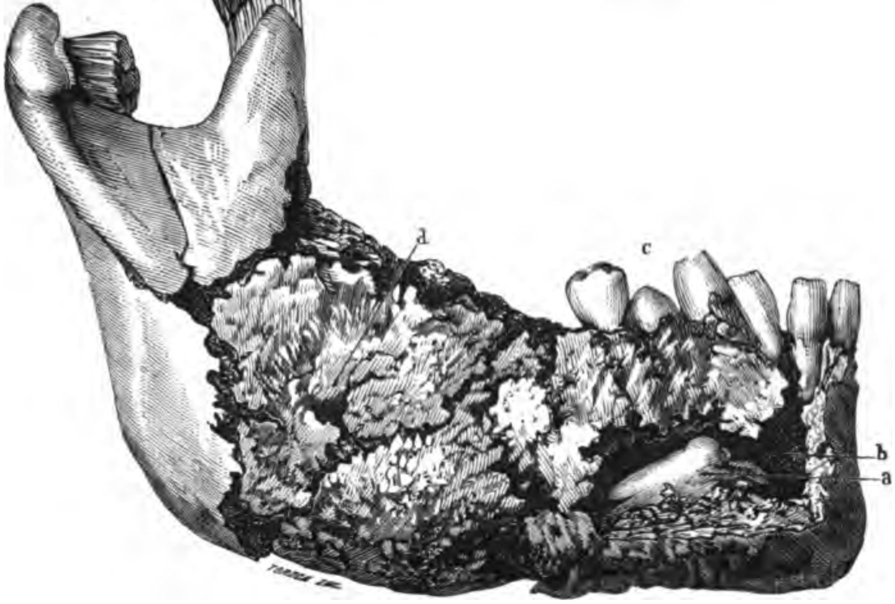


PLATE 6.



### Resume.—*Diagnosis.—Treatment.*

The diagnosis of the diseases of the maxillary bone, which have been for the most part comprised under the vague name of *osteosarcoma*, has long been undecided, confused, and subject to numerous errors.

A profound study of the histological elements of these diseases has enabled pathological anatomy of late to give a more exact idea of their nature. This, taken in connection with clinical teachings, has determined the difference between them, and subordinated their treatment to the anatomical varieties which mark them. It has also been the design of the present work, and one I hope I have attained, to throw some light on a question of pathology, hitherto obscure, and to open the way to a more severe therapeutic induction.

Thus, in resuming at the symptomatic point of view, the cases contained in this memoir, we find one constant and primordial fact—the absence of one or more of the teeth, which have at no time taken a place in the dental arch. This leading circumstance, ordinarily accompanied by very obstinate neuralgia is due to the displacement and to the elongation of the dental nerves deviating from their proper direction. This results more or less immediately in the formation of an intramaxillary cyst which may sooner or later appear exteriorly under the form of an osseous tumor. Then, when this is manifest with the other antecedents, the surgeon is the more authorized to act promptly, as, in attacking the evil at its root, his intervention should have in view to prevent the ulterior consequences, which, although variable in extent and in gravity, have all, nevertheless, the common character of causing a development of the bone. Hyperostosis thus produced may be unilateral, or bounded by one of the faces of the bone; juxta-alveolar, or circumscribed by only one of the alveoli; or, circumferential, when it occupies the body of the bone.

The inflammation of the bone, as we have seen the direct cause of it, is condensing or rarifying.

In the first case, it is characterized by the peripheric accumulation of osseous elements in excess; this is particularly evident at the angle of the lower jaw and at the base of its coronoid apophysis in the subject of our ninth case. In the second case, it gives rise to vascularity of the osseous tissue from which its sensibility greatly increases. The excess of nutritive movement following is marked by disaggregation of the calcareous elements and the hypertrophy of the organic substance, which, in some cases forms a truly interlamellar myeloplasma, a result causing the jaw to lose its consistence and become very fragile.

These two pathological conditions terminate by suppuration and give place to the formation of multiplied encysted abscesses; these we have found to co-exist especially with anomalies in the position of the teeth.

The third morbid form, which is more particularly met with in anomalies of nutrition, that is to say, where the dental ostoid constitutes a voluminous tumor, is to be understood by a kind of partial or general deduction of the two tables of the bone which, by the slow reabsorption of the organic elements, terminates by being transformed into a cavity whose walls are often constituted by very thin, compact tissue. It often happens that under the confines of the encysted products all the characters of condensing inflammation of the bone present themselves.

It is to be remarked that, in all of these cases, the disease is developed slowly; for some time stationary, it remains nicely circumscribed to the jaw, and at no period of its evolution does it exercise that deleterious influence on the constitution which appertains to accidental disorders; finally, the most minute anatomical examination has in no case revealed the presence of heteromorphous elements like those common to cancerous affections.

This last circumstance, if more favorable for the prognosis, is not the less interesting in view of the treatment; for if a cancerous production exists, the intervention of the surgeon cannot be too radical, but on the contrary, more moderation and reserve must be practiced in the case of a benign and essentially local lesion where the operation can be confined to the precise limits which circumscribe it. Thus in a disease exclusively bounded by osseous tissue, and the base of the jaw, if not perfectly intact, at least but slightly affected by it, the anatomical researches I have made demonstrate the possibility of preserving the continuity of the bone in most cases, making it a duty on the part of the surgeon not to have recourse at first to the partial amputation of the jaw. It is wrong, however, to conclude from these general remarks that, in order to remedy the divers pathological conditions mentioned in this memoir, we can proceed according to some fixed rule. To formularise absolute precepts necessarily obligatory, when experience presents us with facts so different in form, aspect and gravity, although of a common origin, would be to ignore the particular indications which are found in these individual differences, and which are prescribed by the same nature as those secondary disorders which may be produced, not only in the maxillary bone, the primitive seat of the evil, but also in the surrounding soft parts. Thus in the third case of this memoir, it was only necessary, in order to effect a cure, to remove some foreign bodies; some others, on the contrary, would necessitate a much more grave operation. In this, moreover, the surgeon should remember the important indication due to the excellent researches of M. Flourens, on the regeneration of the osseous tissue, by preserving the periosteum as much as possible in the wound by a kind of previous decortication of the jaw about to be raised.

Finally, the treatment proper for like tumors is not clearly indicated; however attentive in clinical examinations, in all cases the incertitude as to the diagnosis is not removed; the origin and seat of these morbid phenomena in the substance of the osseous tissue, on all sides enveloped, remains very obscure. Now the doubt in such cases is in favor of that prudent and conservative surgery to which the man of art should always render an account.

## *Explanation of the Plates.*

### PLATE I.

Fig. 1.—This figure represents part of the left side of body of the lower jaw; the cavity contains the tumor.

*d.* View of the side of the alveolar border.

*a.* Orifice of the dental canal.

*b.* Showing the bicuspid in the line exposed by the anterior resection.

*c.* Crown of the first molar tooth in regular position.

Fig. 2.—*c.* Crown of a large molar seen by a cut made in the wall of the cyst.

*d.* Bicuspid.

*e.* Bicuspid.

*a.* and *b.* Points of the same wall perforated by the prolongations of the tumor.

*f.* Most elevated point of the tumor,

### PLATE II.

Fig. 1.—*a.* Interior appearance of the tumor.

*b.* Large molar reversed.

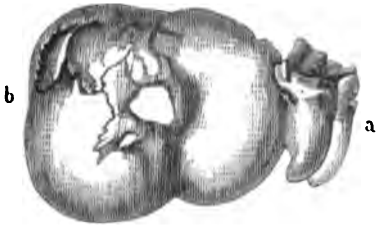
*c.* and *d.* Cellulo-fibrous membrane interposed between the cyst and the tumor.

Fig. 2.—Examination of the tumor under the microscope by M. Ch. Robin, (400 diameters.) This portion of the tumor is chiefly composed of dentine, the tubes of which radiate more or less regularly from minute depressions in its substance. These tubes closely approximated to each other in one part of their course, diminish in number, and become more and more minute and ramified as they approach the surface of the tumor.

Fig. 2. *d, f.*—They terminate in a fine point towards the line of junction between the ivory and the enamel (*a, b, c.*) or with the cement (*f, g, h.*) The presence of the ivory forming the greater part of the tumor, demonstrates its character. *Enamel.*—Another important peculiarity is the presence of the enamel at the surface of the tumor and dipping into the depressions which separate the superficial lobules. This enamel varies in thickness. The section of the tumor represented is taken from that part where the enamel is wedged into the dentine. From microscopic dimension it varies to about one millimetre (one-twentieth of an inch.) It is easily recognized by its straight prisms placed close together, and measuring from $\frac{1}{12000}$ to $\frac{1}{12060}$ of an inch in diameter; at *c*, they are, by the accident of preparation, cut obliquely; at *b* more transversely, and at that part their characteristic form begins to appear.

*Cement.*—At the bottom of the crevices, and here and there in the thickness of the tumor, near its surface, especially in that portion of it which was surrounded by the maxillary bone, the microscope shows laminæ of different thickness, composed entirely of cement.—Fig. 2, *g*. This is immediately in contact (fig. 2, *f*,) with the ivory, between the masses of which it is interposed; at some places it nearly and at others quite, reaches the enamel. Fig.

PLATE 3.—FIG. I.



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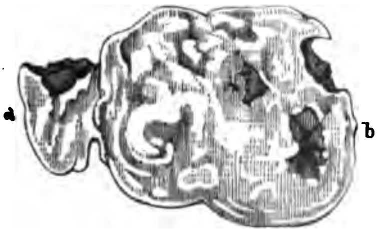


FIG. 3.

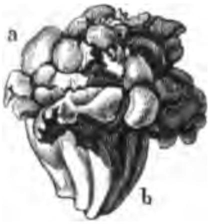
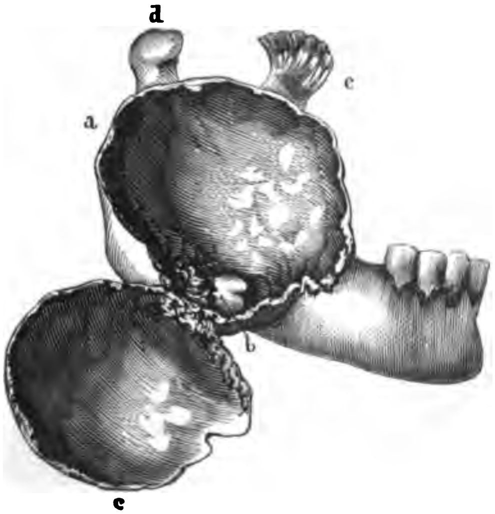


FIG. 4.



2, *f*, *g*, *h*. Besides these structures, sections of the tumor showed small spaces which were either empty or filled with a grayish or brownish matter. These little orifices from $\frac{2}{100}$ to $\frac{3}{100}$ of an inch in diameter, are separated from each other by about $\frac{2}{15}$ of an inch. The microscope shows that these orifices are continuous, with straight, irregular cavities, sometimes forming long canals, hollowed out in the ivory through which they pass. It also shows that these tubes diverge from the cavity just as the tubes of ivory in a healthy tooth diverge from the pulp cavity. The straight, irregular, more or less elongated canals traversing the tumor, and some of which nearly reach the surface, are nothing else but the pulp cavities of the morbid product, either empty, by dessication, or yet containing the dried up pulp in the form of powder.

## PLATE III.

Fig. 1.—*b*. Osseous tumor attached to a molar tooth. (*a*.)
Fig. 2.—*a*, *b*. Sections of the tooth and the tumor.
Fig. 3.—*a*, *b*. Tumor formed by the abnormal development of the bicuspids.
*a*. Top of the tumor. *b*. Its root.
Fig. 4.—*a*. Cyst in the right branch of the lower jaw.
*b*. A molar tooth enclosed in the osseous tissue.
*c*. External wall of the tumor turned over.

## PLATE IV.

Fig. 1.—Represents a cyst occupying the entire extent of the right side of the lower jaw and its coronoid apophysis. The external wall has been removed, leaving a view of its internal wall.

*a*. The wisdom tooth developed abnormally.
*c*. Dental canal open.
Fig. 2.—Same cyst as that in Plate 6.
*c*, *c*. Three incisor teeth, the canine and the bicuspids deviating from their position and leaning against each other.

## PLATE V.

Right side of the lower jaw affected by *ostéite raréfiante*.
*a*. Large molar tooth encysted in the bone.
*b*. Interior of the cyst.

## PLATE VI.

Fig. 1.—*a*. Incisor tooth reversed and directed towards the intermaxillary symphysis.
Fig. 2.—*c*. Canine tooth developed in the substance of the floor of the nasal fossæ.
*b*. *b*. Section of the maxillary sinus.
*d*. Nasal spine.
*a*. *a*. Posterior border of the nasal fossæ.

## PLATE VII.

Figs. 1 and 2.—Two more examples of anomalies in the position of the teeth.

## ARTICLE II.

### *Practical Dentistry.* By R. ARTHUR.

DURING the last twenty years there has been a great deal said about the advancement of the "Science" of dentistry. It has been truly urged that, as the teeth constitute a part of the animal organism they cannot become the subjects of disease independently of the rest of the system. That, with the rest of the body and the teeth, there are reciprocal morbid influences continually at work. No one, it has been urged, can be well qualified to practice dental surgery, unless he has a general acquaintance with anatomy, physiology, pathology and the nature and application of remedies. No one, at the present day, will be disposed to question the truth of this position. And yet, it may well be questioned whether the "Scientific" aspect of the necessary acquirements of a practicing dentist has not been held up too prominently before those who are about engaging in the practice of dentistry; whether the "Art" has not suffered in consequence.

While no intelligent dentist will undertake, for a moment, to deny the advantages of a large acquaintance with the human body, both in health and disease, as bearing upon his specialty, it must be conceded that dentistry is a manual art. The highest eminence in the practice of this art can never be reached independently of great manipulative dexterity. The disease known as dental caries, gives the dentist nearly all his work. He is by far the greater part of the time engaged in endeavoring to arrest its progress. Dental caries is produced by agents held in contact with a certain part of a tooth, and which effect a "solution of the continuity" of the part. The sole object of the efforts of the dentist is to restore this continuity, either by removing the broken and irregular surface, or by filling up the cavity formed with some material not subject to decomposition, and leaving the part in such condition that foreign substances will not be readily retained in contact with it. This constitutes the whole of the treatment of dental caries in the earlier stages. The material employed as a substitute for the lost dentine and enamel, best suited for the purpose, is now universally conceded to be gold. It must be so placed in the cavity of decay as to fill it up completely, so as to restore the part as nearly as possible, with some important modifications, to its original form. The preparation of the cavity, the shape given to the affected part of the tooth, the filling up with the gold, and the finishing of the filling, constitute together, an operation which must be performed in the most complete and perfect manner, to accomplish the object in view. In the treatment of dental caries, no assistance is derived from nature, as is the case with most operations in general surgery, in which the vital powers soon obliterate traces of the most bungling work on the part of the surgeon. The success of a "filling" depends entirely upon the perfection with which the work is done, subject, of course, to failure in some cases, from subsequent want of cleanliness on the part of the patient.

The operation to which I have been referring as employing nearly the entire time of a dentist, is in many cases of a most simple character. To prepare properly and fill many cavities of decay, require no more manual dexterity than it does to drive a nail badly into a board. In estimating the character, however, of many of these operations, it is necessary to consider the difficulty of access to many parts of the teeth in the mouth, the necessity of avoiding the pulp in the preparation of the cavity, the interference of the gum, the blood from parts it is impossible to avoid wounding, the mucous secretion, the saliva, the difficulty of seeing every part of the cavity during the operation, the frequent inability of the patient to bear steadily the unavoidable fatigue and pain, the frailty of the walls of the cavity, besides many other difficulties which it would require pages to describe, but which will occur to every practicing dentist, and when all these things are taken into the account, it is obvious that this operation requires the very highest order of manipulative skill. This kind of manual skill it is not in the power of every one to acquire; few indeed, the observation of every dentist of experience proves, possess it in a high degree, and when the natural ability does exist it has required long training and steady persevering labor to develope it as we have seen it developed in some very few operators at the present day, who stand prominently out among a number of practitioners, whose claims in this direction cannot be considered insignificant. If it be true that those persons who are endowed by nature with that rare talent of executing readily with their hands the conceptions of the mind, find themselves after years of faithful practice, steadily improving in their operations, and from year to year rendering better service to their patients, how much more necessary is it for the mass of men who turn their attention to this manual art to be made clearly to understand that their best and most earnest efforts are to be directed in this way, instead of leading them to believe that the theory of dental surgery is one of the most profound and intricate sciences known at the present day. I have no hesitation in asserting, and defy successful contradiction, that the theoretical knowledge necessary to qualify a practicing dentist for the duties he is called upon to perform, is comparatively easily acquired. While on the other hand the skill necessary to operate serviceably in cases which will present themselves almost every day in practice, can be acquired only by years of hard, careful, thoughtful, laborious effort.

Considerations of this character are forcing themselves upon many of those who are faithfully endeavoring to discharge the duties of their profession, in consequence of the almost daily, melancholy evidences of the entire worthlessness of a vast number of operations performed by dentists, young and old, occupying various positions, from the pushing advertising charlatan, to some of those enjoying the confidence of the best classes of the community. I refer to this matter not with any particular person or persons in view, not having the slightest disposition to make any of those covert but transparent petty personal flings, which have, to the great discredit of some of our periodicals, become so frequent of late. My object is rather to lead practicing dentists to the inquiry whether the advancement of dental surgery, in its most essential feature, has not been retarded by the stress which has been so much laid upon the necessity of the cultivation of the less practical branches of dental surgery.

There is, unquestionably, a great want in every part of the civilized world, so far as we have any acquaintance with their wants in this respect, of competent, careful and conscientious dental operators. For such men there is a large field every where. The harvest is truly abundant and the laborers few.

I am not at all disposed to deny that the number of good operators is increasing every year, but I am not sure, judging from my own observation, that the proportion greatly increases, and I have little doubt that the advance of the practical features of our useful vocation has been greatly retarded by an exaggeration of the scientific requirements necessary to make a competent dentist. A sickly struggle has been made for years, to place dentistry, as a "learned" profession, on a level with that of medicine. I mean that it has been urged that the actual intellectual preparatory requirements were equal. Indeed one would be disposed to conclude from the manner in which some of the "new lights" of dentistry express themselves, that it is not only a branch, but the most important branch of the healing art, in comparison with which, the minor branch of general surgery sinks into insignificance. It would be inferred from some of these learned gentlemen, that medicine is a branch of dentistry, but that, unfortunately for the latter, it has got the start in growth, and has most shamefully overshadowed it. That the exponents of the "science" of dentistry are most shamefully used by their fellow-doctors, whose ignorance prevents them from taking in an adequate idea of the scope of the profession. And many have been the frowns of indignation because of the unwarrantable refusal of this arrogant elder brother to take the younger scion into his household, and recognize his legitimacy; and because he cannot, on all occasions, succeed in concealing entirely his aversion to the assumption of a title which, in the healing art, he considered as already appropriated by himself.

No one can place a higher estimate upon the claims of dentistry to respect than I do; and no one, I am sure, would be more ready to exact it on all necessary occasions. No one can appreciate more highly than I do its just scientific claims and requirements; but I regret that exaggerated ideas of these claims and requirements have sometimes exposed us to just sarcasm, and have impaired our usefulness. It is always best that a man or class of men should correctly appreciate the position they occupy, and meet its requirements.

It cannot be denied that the great want of the community, even in this country, at the present day, in reference to dental surgery, is competent and faithful operators. I would urge, and if I could, would induce others who may have any influence, to urge upon students and those who have just commenced the practice of dentistry, the importance of directing their very best efforts to acquiring skill as operators. The true pathway to success and distinction lies in this direction. Let every young man labor with steady, patient perseverance to overcome the manual difficulties he must encounter in practice, and when he has succeeded in becoming a good operator, he will have accomplished more in his sphere as a dentist than if he had become a perfect master of the sciences which form the basis of the whole healing art.

If he allow his early days to pass with his attention diverted from this paramount demand upon his time, he will lose the golden moments when the hands and fingers more readily respond to the requirements of the will, than after they have become fixed in bad or imperfect habits.

There is no fear whatever, that by following this advice, a man of the right stamp will neglect other necessary qualifications. He will find from the very outset that the necessities of his practice will compel him to see; that while he *must* operate well, he can never be a thorough dentist if he is a *mere* operator.

And while the dentist keeps steadily before him the object and purpose of the business in which he is engaged, and keeps himself always fully up to its requirements, no one will rejoice more heartily or encourage him more earnestly than I will, to push his investigations and studies in a direction however far away it may seem to lead him, if they tend to throw light upon our specialty.

## ARTICLE III.

### *Hints and Suggestions to the Dental Profession.* By T. D. Thompson, D. D. S.

It must be a noticeable fact to all properly instructed dentists that a knowledge of physiology, in its most limited sense, is lamentably universal.

Although by far the larger majority of mankind may be in a measure interested in this subject, they nevertheless manifest an indifference to a knowledge of their physical being, which to a reflecting mind, is surprising.

As relates to most of the affairs which affect the welfare of our race we are alive and active.

The love of wealth is so universal to man's nature, that his mind is racked, and his whole being, physical as well as intellectual, taxed to its utmost powers in its pursuit or acquisition.

No ocean is there too broad, no river too long, no mountain so high, as to debar him from this pursuit of *gold*.

Again, of reading, the mind absorbs, maelstrom like, book and pamphlet with an interest to which even the midnight hour is a witness. The matter thus imbibed often is poison to the mental as well as to the physical being.

It surely must be admitted that there is a disregard for "the house I live in," which is hastening its premature ruin and eventual rapid destruction.

The words, "know thyself," are replete with meaning, as relates to man, whether physically or intellectually.

This general deficiency of physical knowledge has often suggested to our mind the *imperative* necessity of every dentist being *well* instructed in the specialties of his profession. Thus instructed, they will be enabled carefully to direct their patients in that department of physiology which is legitimately connected with their professional practice.

Here let me say, that I presume it will be admitted by the majority of those persons who have limited their studies to a dental office, that the incentives have been very feeble to study the various works which treat on anatomy, physiology, and other kindred subjects, necessarily connected with their future professional practice. A want of such knowledge must limit their usefulness in their profession. Skillful manipulations in operative and mechanical dentistry will not always suffice.

I trust the preceding last remarks may meet the notice of some student now pursuing his instructions in a dental office, who has a higher aim than the mere mechanical part of his profession, and who has determined to fit himself fully for his future course in life. Still he may be hesitating as to the necessity, and may question even the value of a course of lectures at a dental college. We would say to such an one, do not hesitate, for we believe that the advantages to be derived from such a course may be of the utmost importance to your future prosperity. Let not the prejudices of others influence your decision. We have never conversed with an individual who had attended a course of lectures at a dental college who did not express himself as being well repaid by the knowledge thus acquired.

Another thought, you will have no after regrets, but will feel that you have by thus doing aided in the advancement and elevation of the profession of your choice.

## ARTICLE IV.

### *Improved Method of Casting Metallic Dies Direct from the Plaster Impression.** By Dr. J. Carroll House.

* * * * * * * *

Having thus dwelt, perhaps, at greater length than our present limits will warrant, upon some preliminary considerations of mechanical dentistry, we now proceed to discuss a method for procuring the metallic die, which shall, as nearly as possible, represent the organ of which it is the counterpart. And we may here be excused for remarking that the peculiar manipulations to be described originated with ourselves. (The casting of a die from the impression itself, as hereinafter mentioned, however, is not recent.) These we have constantly practiced for some years; and when we say that we have never been obliged to make over a single piece from any imperfection of adaptation in the base plate, we think that this statement of itself, will show the superiority of our method over any other now pursued by the profession. Many of the other methods have been tested in comparison with this one, and in every instance it has been proven the best. We refer now, of course, to simply swaged work.

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*Owing to the length of Dr. House's interesting thesis, we have taken the liberty of publishing only those portions immediately relating to the new method.—Eds.

We always take our impression of the jaw in plaster of paris, and in order to more complete success, we use the finest that can be procured. Having a good quality of plaster for taking the impression, it is necessary to use an impression cup, large enough for the impression to possess sufficient strength in every direction to permit of its detachment without endangering its safety. This may generally be done by reversing the cup, which may be made of Britannia metal, with the impression downwards, on a table, protected by a few thicknesses of cloth or paper, and rapping gently on the cup with some light instrument; by this means the cup becomes detached from the impression, isolated, and we are now in condition to proceed to the next step of our manipulations. As there is sometimes difficulty in procuring the kind of cup here referred to, those made of sheet tin may be recommended; but as the plaster, in hardening, attaches itself pertinaciously to the cup, the loosening of our impression becomes one of danger and difficulty. To coat the cup with a thin film of oil before placing the plaster in it, would indeed easily prevent this, but it gives rise to a greater evil, namely, the detachment of the cup in the act of removal from the mouth. This accident often happens in the use of any kind of cups. To obviate this last embarrassment we contrived a cup made according to the following directions:

Procure from the tinners some scraps of tin plate of different degrees of stiffness, and with a strong pair of plate shears, a small copper soldering tool, and some bits of solder, we have all the articles necessary. Proceed to cut a

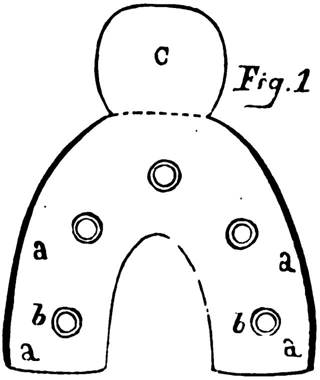


Fig. 1

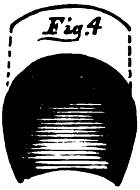


Fig. 4

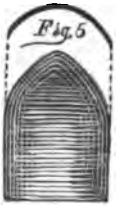


Fig. 5

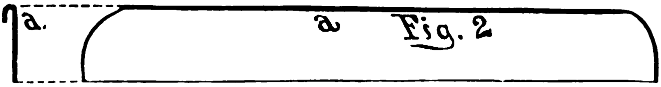


Fig. 2

base plate of the form represented in fig. 1, and around the periphery of the arch, *a a*, turn up a shallow flange about the $\frac{1}{16}$ of an inch high, to act as a shoulder or support to the curve, and also to stiffen the plate. In this plate punch several holes, as at *b b*, about a quarter or three-eighths of an inch from the rim, and an eighth or $\frac{3}{16}$ of an inch in diameter; these holes are to be countersunk from above in such a manner as to allow the bevel to reach the under side. In the posterior part of the plate it will be observed that a portion of the plate is cut away. The space is covered by a raised cap (fig. 4) which is soldered around its edges to the base plate, thus giving the requisite prominence to the part which carries the plaster into the palatine arch. We now take a strip of thin plate, (fig. 2,) of such width as to give the proper depth to the cup, the edge of which, at *a a*, doubled upon itself,. gives us a thickness at the upper edge precluding the possibility of lacerating the mucous membrane or facial muscles. The strip is now bent, with the turned edge outward, so as to spring into and fit the flange around the base plate, and secured by solder. To give greater thickness and strength to the anterior projection, (*c*, fig. 1,) which serves as a handle for the introduction and withdrawal of the cup, we cut out a cap (fig. 5) and solder it around the edge, and also to the curve or rim; the piece being *raised,* as the tinners term it, by a round-faced hammer on a piece of lead, a slight convexity and consequently greater strength is given.

Beyond the holes in the plate we have only thus far given a description of the ordinary sheet tin impression cup, such an one as we might use in any upper case with wax or gutta percha, when it is desirable to carry the impression back to the posterior part of the jaw; but we have spoken of it thus in detail for the purpose of pointing out the improvements which give it a great advantage over the ordinary cup.

Having our cup properly constructed, we may now take a piece of thin sheet tin and cut out a piece of the exact size and shape of the base plate; with this difference, that the anterior projection, answering to the handle, should be a trifle larger than in the cup proper; this extra part we turn up into a flange which allows the cup handle to be set down into it, and it serves to keep this plate, which we call the *supplemental cup*, (fig. 3,) in place beneath the true cup when in use. Taking a medium sized hammer with a convex face, and laying this supplemental cup on a counter die, a shallow cavity should be sunk around the centre of the plate *a a*, not exceeding the eighth of an inch in depth. When this supplemental cup or plate is placed beneath the cup proper it will be perceived that a sort of dripping dish has been made; and when the soft plaster is poured into the cup, if any should make its way through the perforations in taking the impressions, it is caught in this receptacle. The supplemental cup thus accomplishes its design.

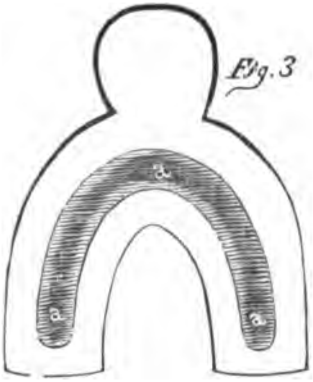


Fig. 3

When complete, the cup is not so heavy as the ordinary one of the shops. We give two sectional drawings of them as completed and ready for use. Fig. 6 is a section taken from the centre of the anterior projection, and fig. 7, a transverse section, as indicated by the line *c c*, fig. 6. The references are the same in each drawing; *a a* is the base plate; *b b*, the raised portion of the cup; *d d*, the rim or curb; *c c*, the supplemental cup; *i i*, the countersunk apertures in the base plate, underneath which the cavities in the supplemental cup may be observed.

Fig. 6

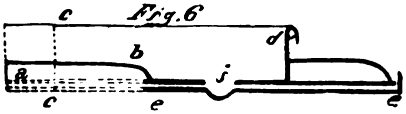
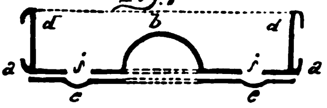


Fig. 7



One will necessarily require several of these cups, and to avoid confusion, it would be advisable to number each one and its supplementary cup with corresponding numbers.

In taking an impression, we first take a piece of very fine brass gauze, of about fifty meshes to the inch, cut it in the shape somewhat like the outline of fig. 1, less the handle, about half an inch broader, and a quarter of an inch longer. This gauze is then pressed down into the cup as close to the plate as possible, turning the edge up against the curve. This the pliancy of the gauze will readily permit, after having been properly annealed. Taking out this adjusted gauze, we oil the inner side of the cup, replace the gauze, fill with semi-liquid plaster, and take our impression as usual. On withdrawing the impression, after it has perfectly hardened, any superfluous plaster which may have worked over on the outside of the rim, is trimmed off and removing the supplemental cup with care we find that the plaster has either naturally run through the holes or has been forced through, and meeting with resistance has headed over, firmly fastening the impression, and precluding the possibility of the detachment of the cup when taken from the mouth. Taking the plaster knife, these rivet heads may be cut away, and gently tapping the cup, the impression comes away also.

Another method of taking impressions, or rather of preparing the cup, (communicated to the class of the Baltimore Dental College, December, 1859, by Mr. Bean, of Florida,) is to strike up an impression cup of sheet zinc on an enlarged model of the jaw, and, having given this a coat of melted shellac inside, some clippings of woolen cloth are beaten into it; when the cup is used with plaster these woolen fibres act as minute stays, holding the film of plaster to the cup. This mode, however, is open to the objection that the body of the plaster in the impression, being necessarily very thin, is liable to crack and break away from the unequal expansion of this corrugated plate in the heating required to melt the shellac in loosening the impression therefrom. This, of course, renders it unavailable for our purpose.

Having procured an impression, we now proceed to determine the requirements of the case as to a cavity ; if one is needed, what shall be its character and shape; and where shall it be placed? * * * But it would occupy too much space to detail the various requirements which may be met with in the kaleidoscopic presentations of individual cases. We may, however, offer the following general classification:

First.—In mouths in which the alveolar arch is very prominent, both on the palatine and on the buccal exposure, and in which the posterior lobes of the alveolus are very marked, we need only a good fit.

Second.—Where the development is the same as above, with the difference, that the buccinator muscle has its attachment low down on the buccal exposure of the alveolus, preventing the *return* of the plate far into the exterior of the arch—we must have a very perfect adjustment to the palatine surface of the jaw; this may be accomplished by means of two shallow cavities opposite the palatine exposure of the alveolus, where normally the first and second molars were situated; in connection with these we should have an accurate adaptation to the ridge of the jaw throughout its entire arch.

Third.—Where the palatine arches are shallow, with high attachments of the facial muscles, an accurate fit is sufficient, but if as in the

Fourth category, the facial attachments be low, and the whole jaw is decidedly flat, we have to depend entirely upon a large, well-defined, but shallow vacuum chamber in the central horizontal part of the plate covering the roof of the mouth.

Fifth.—The peculiarity we now arrive at may occur in connection with any of the former classes; it consists in a flabby or spongy development of the muscles and mucous membrane covering the posterior part of the palatine arch; the indications are to add, to those previously mentioned, a light bead, either by swaging or soldering a half round wire to the upper posterior edge of the plate, extending from the inner edge of the alveolus on one side, to the corresponding point on the other side. The bead should be raised to suit the vascularity or looseness of the membrane; this condition of the parts may extend forward, when it will be necessary to enlarge the depressions for the reception of the rugæ.

Sixth.—Under this head are included all those cases, in which, unlike the preceding, the entire membrane, covering not only the palatine but also the buccal surfaces, is of a firm, dense, and unyielding nature. In such cases we will find the adherance of the plate greatly increased, if, in addition to the other expedients, we *chase* the entire palatine exposure of the plate with deep lines.

The next step is to obtain the metallic dies; and this may be done as follows: Take a piece of thin Russia sheet iron, of an average width of four inches, and having cut it as in fig. 5, it should be bent to correspond to the outline of the impression, the smaller opening or end of the so formed tube, being about the eighth or quarter of an inch larger all around than the impression; the two ends are then brought together with a tinner's lock-joint, at the apex of the arch, the seam being outside. (Fig. 9.) We

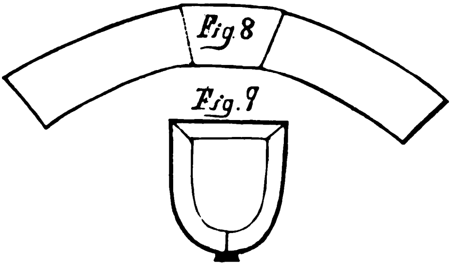


Fig 8

Fig. 9

now have a curve whose concavity will give us the requisite inclination for drawing the die. Around the smaller end of this curve, about a quarter of an inch from the margin, we prepare a wire net-work, as shown in fig. 10,

Fig. 10

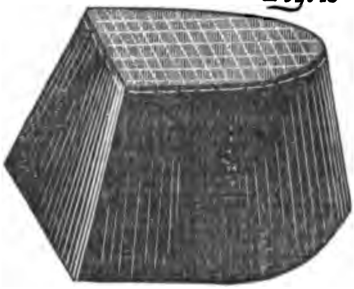
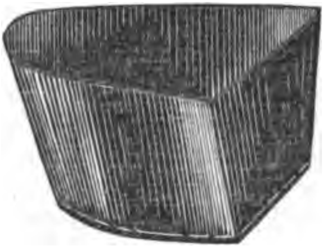


Fig. 11



and, having placed the apparatus with the wire part down, on some smooth, well-oiled surface, the plaster impression may be placed inside, equidistant from every side. The mixture of plaster, asbestos and water, is now poured around the impression so as to imbed all of it except its face. The plaster, it will be perceived, passing through the net-work, secures itself. As this is partially solidified we should next take some of the same mixture and bank it up with the spatula from the impression to the iron. This accomplished, we have a mould as is represented by fig. 12 and fig. 13. After this has been

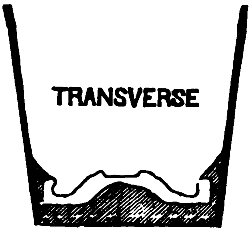


Fig.12

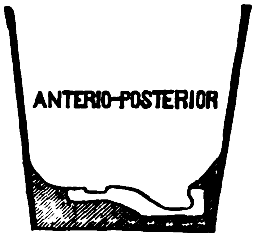


Fig.13

slowly dried until it has changed to a faint cream color—when the metal is just fluid, a piece of plate, (fig. 14,) so bent as to direct the stream to the posterior part of the mould, is adjusted and the metal may be poured. When the most elevated portions of the impression have been covered to the depth of half an inch, the piece of plate (fig. 14) may be removed, and we again pour until we have a thickness of two inches. Having procured a good cast, by making use of all the incident expedients, when cool it can be removed, and if there is no very decided undercut to the impression, we may cast a second die from the same mould.

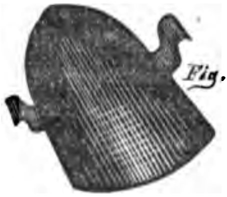


Fig.14

* * * * * *

Now as to the principles involved in the preceding, it may be rmarked, in opposition to the objections urged against the general practice of taking metallic dies direct from the plaster impression, that it is a well known fact that calcined gypsum, having first been minutely pulverized and then mixed with sufficient water to form a creamy liquid, in passing from the liquid to the solid state, increases about $\frac{1}{350}$ of its bulk. This enlargement is retained, even after the latent caloric has been in a measure parted with. This expansion of plaster is supposed to be taken advantage of, by some, to counteract the shrinkage of metals and metallic alloys, in making dies for swaging plates. This is done by first taking the impression, and therefrom a model in this material; two expansions, it is said, are thus obtained against the one contraction in the metallic die. It is urged that in casting the die direct from the impression, the usual expansion is not allowed; this of necessity, gives an incorrect die. Again, it is objected, that, as it is impossible to dry the mould, the impression cracks when the metal is poured, and the die, consequently, becomes more or less rough.

To these objections, we may, in the first place, refer to the wire gauze in the body of the plaster impression; this, remaining encased, with the obvious precautions as to drying, by its minute ramifying wires retains the impression in perfect shape, and precludes the possibility of fissures or cracks in or upon its surface. The wires being slightly corrugated they expand but imperceptibly longitudinally; this slight expansion of the wires upon themselves, however, influences the whole impression in the aggregate expansion of all the wires.

In the second place, the property of zinc to shrink from the centre to the circumference, is an auxiliary to success; for in pouring, with a little dexterity, the cavity formed by the shrinkage, when cooling, is filled with more metal. The necessary manipulations, to accomplish this last end, will readily suggest themselves in the laboratory.

In order to test the excellence of the die obtained by our method, we constructed an apparatus—too complex for description here—by which we were enabled, with micrometric exactness, to ascertain it to be perfect.

The processes for obtaining a die for the lower jaw are quite similar to those for the upper.

## ARTICLE V.

*Platina and the Metals which Accompany it.* By MM. H. SAINTE CLAIRE DEVILLE and H. DEBRAY (Translated for the American Journal of Dental Science from the *Annales de Chimie et de Physique.*)

THE metallurgy of platina is an art entirely modern; the introduction of the metal into scientific and industrial laboratories being of recent date. Hence all that pertains to the metallurgy of this metal and its congeners, is in general little known, though specially deserving the attention of the chemist. His personal interest should attract him to the subject, for he is the chief consumer of platina, and to this metal he owes (with the exception of some capital experiments) the means of operating securely and promptly in the majority of chemical analyses. Up to this time, in fact, outside of chemical uses, platina has had no application of any importance. The ores of platina, when the search for them shall be better understood, or the known localities thoroughly worked, will probably not be more rare than gold; and as this metal is nearly indestructible and its high value protects it against loss and accidents of all kinds, it will ultimately accumulate in commerce, and become more and more common. Perhaps then it may be generally used where its great density and somewhat tarnished appearance will present no obstacle to its employment, and especially where its absolute inalterability will be of some importance. All these questions depend, for their solution, upon the price at which the metal can be furnished, and chemists are interested in seeing it lowered to a point which will permit the large vessels of our laboratories to be made of platina.

It is in the hope of facilitating a progress of this kind, that we have undertaken the troublesome researches, the results of which we are about to give in this memoir—

researches which have cost us more than four years of labor. If we succeed, we are sure of finding a very sweet recompense in the kind feelings of our brother-chemists whose studies we shall have facilitated, our methods permitting us to diminish hereafter the price of recovery of our precious metal. Up to the time of our first communications, no one had thought of utilizing all the metals which accompany platina in the mine, with the exception of palladium and osmium, which were always of sufficient importance to be separated, and platina has been extracted from its ores by leaving a residue which has accumulated in almost all the very few workshops of Europe, and at the Russian mint. We shall show that rhodium and iridium which enter largely into these residues, are very useful in modifying the qualities of platina. Consequently, in finding an easy and economical method for the extraction from ores of platina of all the utilizable substances in the form of an alloy of platina, rhodium and iridium, we have rendered an important service to the metallurgy of platina. We have accomplished this by a method which will be described in detail in this memoir.

To treat securely the crude ore of platina it was necessary to know its exact composition. In one of the chapters of this memoir will be found the analysis of all the known ores of platina of which we have been able to procure specimens, and at the same time a method of assay by the dry way and new processes of analysis enabling us to operate surely and expeditiously.

At the same time we have studied the principal physical properties of the alloys which are obtained by incorporating with ores of very pure platina a certain quantity of residues of platina rich in iridium or rhodium, thus making triple alloys interesting on account of their applications. To understand how to effect these mixtures, we were obliged to know—1, the composition of the residues of platina—2, the composition of the osmiurets of iridium of all the qualities of which we have been able to procure specimens. In this memoir will be found a chapter on the solution of this double question, and the dry methods for the rapid assay of residues and osmiurets, as well as methods by the wet way for the precise analysis of the osmiurets of iridium.

The general processes of the new metallurgy of platina which we propose, are exclusively the dry process and methods of fusion at a very high temperature; they will be successively described in different chapters in which will be treated: the revivification of pure platina—the metallurgy of pure platina—the extraction from the crude ore of a triple alloy of platina, rhodium and iridium of a convenient and constant composition—of the extraction either from residues or from the osmiuret of iridium the utilizable metals which they contain—platina, palladium, iridium and rhodium.

We have succeeded (by thus operating on entirely new methods and at temperatures which have hitherto been obtained only upon comparatively small points,) in making a special study of the properties of the platinoid metals in conditions still not generally known. We shall study these properties in the first chapters which will make up the theoretical portion of this memoir; the rest being devoted, as we have already said, to the analyses and metallurgy, will form the technical part.

We are indebted to General Samarski, chief of the mining corps of Russia, to Jacobi, the counsellor of state, to M. Kocksbarow, of the Academy of Sciences of St. Petersburg, and to Colonel de Rochette, for the majority of the specimens upon which we have operated during the course of our work. It was extremely difficult to procure the elements of our researches, which are not found in commerce, and which the mint of Russia alone possesses. These gentlemen will be pleased to accept this expression of our sincere gratitude.

We are equally indebted to MM. Desmontis and Chapuis, to M. Quenessen and to M. Pavard of Paris, and to

Mr. Mathey, of London, for a great number of specimens of residues of every kind from their shops, which have enabled us to give analytical results as complete as possible in reference to these interesting subjects.

Finally we mention with pleasure the intelligent assistance we have received during a portion of this long labor, from M. Hautefeuille, a very skillful young chemist, to whom we are happy to express our thanks.

## CHAPTER I.

### *On some Properties of the Platinoid Metals.*

The family of platinoid metals has a peculiar character which completely isolates them from other more or less natural families formed from other metals. In our opinion, it would be well to leave all the species which compose it in a single group which would admit them only, and contain them all. It is true that these metals are not all analogous in every particular, but they have a special character, a common physiognomy which will always hinder us from separating as we study them, even when under the guidance of a very rational classification.

These metals are never found separate from one another, except palladium, and that very seldom, and it is to be remarked that palladium is the one among them which approaches nearest the other metals. More or less unchangeable under the influence of oxygen and chlorine, they are similar in the facility with which they surrender to reducing agents, the elements with which they are combined. Their principal affinities are with the halogens, as bromine, chlorine, iodine and cyanogen, and they all form those compounds, characteristic of the series of platinoid metals, in which salammoniac or chloride of potassium is united with a metallic chloride to form a combination generally little soluble in an excess of ammoniacal salt, if the proportion of chlorine combined with the metal is sufficiently high.

All these bodies possess besides the curious property of determining, by their simple contact, a great number of chemical reactions; a catalytic action, as Berzelius called it, which has been used for experiments of the utmost importance to chemistry. It must not be supposed that phenomena of this kind can be wholly attributed to the porous condition of those metals which are only known in the form of sponge. Platina melted and beaten out under the hammer is as active in this way as that obtained by the aggregation of its sponge.

The differences among these bodies are equally remarkable. Thus osmium, which burns in the air to form osmic acid vapor, has been compared to arsenic by Berzelius; while recently Dumas inclines to place it side by side with tellurium. It is certainly a metalloid, the metalloid of the platina series.

Ruthenium, with which we have quite recently become acquainted through the admirable researches of M. Claus, and the oxyd of which M. Fremy has recently obtained in a crystalline form, approaches tin in its chemical properties and even in the form of this oxyd, which is a prism with a square base identical with the prism of oxyd of tin.

We shall show that palladium is analogous to silver by a great number of characters; its volatility, its oxydizability at a properly regulated temperature, which approaches it also to mercury; its action on hydriodic acid, &c.; but the basic energy of oxyd of silver is found in none of the oxyds of palladium.

Rhodium is a metal which can be compared to no other. Placed near silver on account of its oxydizability when hot, the basic properties of its principal oxyd, and the remarkable effect which sulphuric acid or rather bisulphate of potash exerts upon it; near gold, by the reactions of its chlorides, it is difficult to make it a metal less noble than gold, on account of its resistance to the action of aqua regia.

Platina, in all its properties, is the true analogue of gold, and whenever the platinoid metals have not been classed together, platina has always been ranged with gold.

The common metals present but few analogies with iridium, which is superior to them all by the resistance it offers to the majority of our most energetic reagents; and certainly if the physical properties of iridium corresponded with its chemical characters, it would be the king of the metals rather than gold.

All these considerations induce us to form of the metals of platina a group of which every species shall have its analogue among the common metals, and this family will be as natural as is, among mammalia, the family of marsupials, composed of insectivora, rodents, carnivora, &c., which their common physiognomy, in sufficiently important characters, prevents us from distributing in the series of mammalia, so well arranged by Cuvier.

Before examining successively the platinoid metals which we have studied, we must be permitted to remark how incomplete the history of the physical properties of certain simple substances, and especially of the platinoid metals has been left, so that, in reference to that which it would seem the easiest to determine, density, we find usually in chemical treatises only discordant indications. Berzelius, operating on the small quantities of material which he had at his disposal, was content with discovering the simple bodies, their important reactions, their equivalents, and after those magnificent researches which every body knows, he seemed to disdain the radical he had isolated, and generally submitted it only to the action of reagents, neglecting to study its form and the modifications it might receive from physical agents. We would not be suspected of an intention to criticise, in any particular, the method of Berzelius and the results it has produced, especially in what pertains to the platinoid metals. Since we have obtained a complete knowledge of his researches in this direction, we confess that he has left very little to do in the way he had marked out. Those who choose to give themselves the trouble to read with attention all that concerns this question in the *Traité de Chimie*, by Berzelius, will see that he left to M. Claus the distinguished honor of discovering ruthenium only because he operated on insufficient quantities of material.* After Berzelius and Wöhler, after MM. Claus, Fremy, Fritzsche, and other skillful chemists who have studied platina and the platinoid metals by the ordinary processes of the humid method, there remained to us, in order to obtain new facts, no other resource than an entire change of method: this is what we have done, and we proceed to give the results we have obtained.

## I.—OSMIUM.

Osmium has been hitherto prepared in a form which leaves the account of its physical properties as imperfect as if iron had been only known as pyrophoric iron, or silicium and borax in no other condition than that of amorphous and highly combustible substances. We have considered osmium as a metalloid; and indeed, like some other metalloids, it changes entirely its chemical and physical properties in accordance with the manner in which it has been prepared. Common osmium, prepared by the processes of

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* Berzelius (see the first French edition of 1831, vol. iv, pages 456 and 457,) gives the mode of preparing ruthenium by one of the processes recommended by M. Claus; he finds the rose-colored salt, $Ru_2\ Cl_3$, 2Kcl, characteristic of ruthenium, and the composition of the chloride $Ru_2\ Cl_3$, mentions its analogy with and its difference from the chloride of rhodium, with which he compares it, concludes that it is not rhodium, on account of its resistance to bisulphate of potash, and only admits that it is a sub-iridic chloride, because, "when the metal extracted from it by hydrogen is warmed in chlorine gas with chloride of potassium, it gives only the common iridico-potassic chloride, so that it is impossible to attribute its existence to the presence of a foreign metal mingled with iridium. Besides osmium can form similar rose-colored salts."

Berzelius, is a spongy semi-metallic mass, exhaling a very sensible odor of osmic acid, which indicates an appreciable alteration by oxygen at common temperatures. Its density is equal to 7. If obtained by reducing a mixture of hydrogen with the vapor of osmic acid, as Berzelius did, it is metallic, and has a density of about 10.

*Pulverulent Osmium.*—Osmium appears with totally different characters if we prepare it in the following mode. Fine osmide of iridium, sifted through gauze, is used; if that which is naturally pulverulent cannot be obtained, it is chemically divided by a process hereafter to be described in the chapter devoted to ruthenium. One part of divided osmide is mixed with five times its weight of binoxyd of barium, which has been weighed with great care, so as to be able afterwards completely to precipitate it with a known weight of sulphuric acid. This mixture rendered as intimate as possible by prolonged rubbing in a porcelain mortar, is warmed for one or two hours at the fusing point of silver, in an earthen crucible, which has been closed as perfectly as possible by a cover carefully fitted and luted with a little fire clay. After the experiment we find a black homogeneous substance, which is roughly divided and introduced into a glass retort, the beak of which should be ground if possible. A little water is first poured on, then eight parts of muriatic and one of common nitric acid; after which it is distilled, special attention being paid to cooling the receiver, which should be fitted to the retort with the greatest care, to avoid loss of osmic vapor. The operation is finished when the vapor taken at the tubule of the retort no longer possesses the characteristic odor of osmic acid. The liquid contained in the recipient is then distilled a second time, and the product may then be collected in dilute ammonia introduced in the tubulated balloon into which passes the product of the second distillation. The osmiate of ammonia is supersaturated by sulphuretted hydrogen, and the liquid containing the sulphuret boiled a long time and then filtered. The filter must not be dried at too high a temperature, or the sulphuret of osmium will take fire and the substance almost entirely disappear, being converted into osmic and sulphurous acids. The sulphuret is introduced into a crucible of gas-coke, very smooth on the inside, and furnished with a cover which is rubbed to fit closely. This is then placed in a crucible of refractory clay. Between these two crucibles sand is poured, the clay crucible is well covered, and the whole kept for four or five hours at the fusion point of nickel.* The sulphuret of osmium is reduced by the heat and leaves a brilliant metal of a clearer blue color than zinc, in small fragments which are very easily separated. If it is desired still more metallic and more dense, it must be heated at the melting point of rhodium, in an apparatus which we shall presently describe. Then its density is 21.3. Sometimes it is obtained at 21.4; that is to say, it is equal and even superior in density to platina.

This osmium is inodorous and can be heated to the melting point of zinc without giving off vapors of osmic acid. At a higher temperature, however, it becomes combustible.

*Crystallized Osmium.*—When osmium is dissolved in tin by heating it to bright redness with seven or eight times its weight of tin, in a charcoal crucible; if the metallic mass be allowed to cool slowly, osmium separates at the moment of chilling, as boron and silicium separate from aluminum or from zinc, that is, by crystallizing. The tin may then be dissolved out with muriatic acid, leaving a very hard crystalline powder which retains no tin, while the acid does not easily dissolve osmium.

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*At the Normal School we used to produce these high temperatures with fragments of gas coke too hard to be cut for elements of galvanic batteries. This coke, which leaves no cinder, softens those crucibles which are of bad quality, but does not destroy their walls like the clinker of common coke. It kindles with difficulty, but burns with extraordinary energy.

|  | I. | II. |
|---|---|---|
| We have taken |  |  |
| Osmium, . . | 4.00 grs. | 4.50 grs. |
| And mixed it with |  |  |
| Tin, . . | 24.00 grs. | 24.00 grs. |
| After dissolving we have recovered |  |  |
| Osmium crystallized, | 3.96 grs. | 4.60 grs. |

The crystals of osmium are too small to be measured. Upon some, under the microscope, are seen two kinds of very distinct faces, rhombs and squares, so arranged in relation to each other, as to lead to the supposition that the crystals are rhombic dodecahedra with the faces of the cube.

*Compact Osmium.*—An alloy of the same kind may be made with zinc, but the osmium separates in an amorphous condition, or rather the alloy is not broken up by the chilling of the metal; for if the zinc is dissolved out by muriatic acid, there remains an amorphous powder of great combustibility, which is pure osmium, and the acid does not take up a sensible quantity of osmium.

|  |  |
|---|---|
| We have taken |  |
| Osmium, . . . | 8.50 grs. |
| And mixed it with |  |
| Zinc, . . . . | 50.00 grs. |
| After solution we have recovered |  |
| Osmium, . . . | 8.60 grs. |

But if, instead of dissolving this alloy, we drive off the zinc by a very high temperature and finally subject it, in a charcoal crucible, to the heat developed in a furnace of explosive gas, (such as we shall presently describe,) capable of liquefying rhodium, we shall find the osmium perfectly metallic, with a lustre and bluish tint characteristic of this metal. This metal, very compact though it undoubtedly is, has not yet been melted: for it is full of irregular cavities which will be rounded even by the simple effect of softening. These cavities diminish the density of the matter, because they do not fill with water, not being always in communication with the exterior.

This osmium is then very hard, easily scratching glass.

The matter contains no zinc, even when it has been heated only to the temperature of melting cast iron.

We have taken

| | |
|---|---|
| Osmium, . . . . | 4.35 grs. |
| Zinc, . . . | 25 00 grs. |

And have recovered after volatilizing the zinc

| | |
|---|---|
| Osmium, . . . | 4.30 grs. |

Osmium has so little tendency to combine with metals, that on heating tin with osmide of iridium, and attacking the alloy with muriatic acid, we get crystallized osmium in fine powder, and a compound of iridium and tin, crystallized in cubes, which will hereafter be considered.

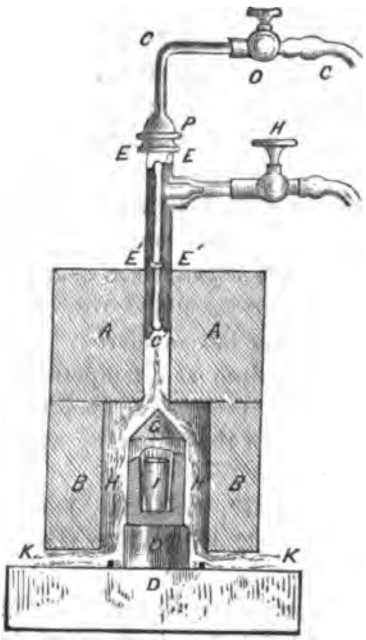
We have attempted to melt osmium at a temperature which we suppose corresponds to the fusing point of rhodium, we have availed ourselves of the following apparatus.

It is composed of a blowpipe, E E′, C C′, fig. 1, of a furnace, A B D, and of a crucible, G H J, in which the osmium is put.

The blowpipe is composed of a copper cylinder, E E, 12 millimetres in diameter, terminated below by a slightly conical platina jet, 40 millimetres long. A copper tube C C C, 3 or 4 millimetres in internal diameter, and terminated by a platina button, C′, which is adjusted by a screw, enters the first cylinder from above, and is kept in place by a screw-cap, P, which enables us, by loosening it, to adjust the button C′, to any desirable height in reference to the inferior extremity of the cylinder, E E, E′ E′.

A cock, H, is applied laterally with a very large tube to the cylinder, E. A cock, O, terminates the bent extremity of the tube, C. By the stopcock, H, hydrogen or illuminating gas is brought to the apparatus, and oxygen is admitted by the stopcock O. The button, C′, is pierced by a hole varying in diameter from 2 to 3 millimetres according to the dimensions of the apparatus to be constructed. We generally use one of 2½ millimetres.

FIG. 1.



The furnace, A B D, is composed of three pieces of well burned quicklime, slightly hydraulic, and just compact enough to admit of being turned. There is nothing gained by using very hard lime which the tool does not readily cut. The lime we use is very common in Paris, and comes from the calcination of the *calcaire grossier* of the tertiary deposits of Paris. A first cylinder, A A, is pierced by a slightly conical opening in which the blowpipe fits tightly to half its thickness, the button, CC′, reaching to within 2 or 3 centimetres of the lower opening of this hole. A second cylinder of lime, B B, is pierced by a cylindrical hole much larger than the first, the dimensions of which are such that it should leave between its walls and the crucible, H H, a distance of 3 or 4 millimetres at most. Its height is a little greater than that of the crucible. A third cylinder, D, on which the second rests, is grooved upon its upper surface by four deep furrows, K K, at right angles to one another, which give exit to the products of combustion. At the centre of this upper surface, and firmly attached to the substance of the cylinder, is placed a little support, D′, on which rests the crucible.

The crucible itself is made as follows: a cylindrical piece of lime, H H, hollowed out to receive a smaller crucible, I, made of gas coke, and furnished with a cover in which is placed the matter to be heated.

The lime crucible is surmounted by a conical top, G, the summit of which ought to be directly under the button of platina, C', at a distance of two or three millimetres, varying with the rapidity of the current of gas. This cone, G, is so made to force the flame of the blowpipe to spread itself equally around the crucible, H, then to issue through the openings, K.

All the cylindrical pieces, A, B, D, ought to be strongly bound with very soft iron bands placed at short distances apart, to sustain the lime which always splits a little during the heating.

To use the apparatus, (the osmium having been introduced into the coke crucible,) the crucibles are adjusted on the base, D; then the piece A is raised with the blowpipe, of which the stopcock, H, for the passage of the combustible gas, is open. The gas in C is kindled, and oxygen gradually admitted by opening the stop cock, O, so as to allow the combustible gas to predominate considerably; then, introducing the flame into the apparatus, all is arranged as indicated in the figure. By means of the screw cap, P, C', is properly adjusted and kept in position for an indefinite time by tightening the screw. The speed of the oxygen and hydrogen currents is then gradually augmented till the maximum temperature is attained. This is directly determined by looking through the apertures of the apparatus, and by attending to the noise made by the blowpipe. This noise should be as weak as possible when the volumes of the gases are in proper proportion. When everything is well regulated, at the end of eight minutes the crucible, to its very centre, reaches the melting point of rhodium.*

---

* At these temperatures, the contact of lime and carbon cannot be indefinitely prolonged without the mutual destruction of these bodies, by the formation of

Osmium treated in this apparatus has a very well marked metallic lustre, with a bluish tint, less decided than when it has been slightly heated. Its density is 21.4, and its properties have already been described. But it presents no trace of fusion. On the other hand, during the entire progress of the experiment, no odor of osmium is perceived in the flame, provided the crucible remains intact. We can then say, that at the temperature of melting rhodium, and in close vessels, osmium is infusible and fixed.

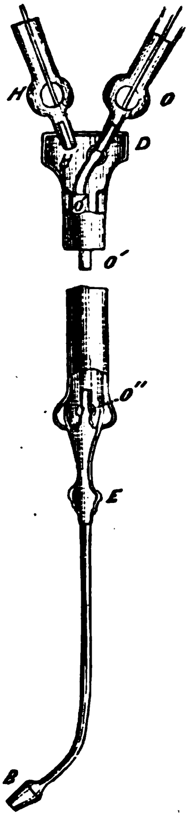
*Volatility of Osmium.*—The case is not the same at a higher temperature, that, for example, at which ruthenium enters into full fusion; which can only be obtained by means of the blowpipe with mixed gases, that we shall presently describe. When osmium is submitted to the action of this flame, which to have its full effect, should be neither oxydating nor reducing, we see, at the precise moment when the heat attains its maximum, considerable quantities of osmium disappear with great rapidity, and deposit themselves as soot upon any object placed in the immediate vicinity of the flame. Osmium can burn then, and does burn, but the operator can readily detect its volatilization. It is a very interesting experiment which should be repeated but with extreme precaution. One of us who has made it twice, was blind for nearly twenty-four hours, in consequence of the current of air, which should have protected him against the copious vapors of osmic acid, having changed its direction and unexpectedly driven these fumes

oxyd of carbon and of calcium, the presence of which becomes manifest in the flame. At the point of contact of the carbon and lime, the latter is deoxydated, gives out the odor of hydrogen, and burns even in water when introduced into that fluid. We can but indicate these phenomena among those which we study at this time with the apparatus we have just described, and with tubes constructed in an analogous manner, in which we are studying a great number of chemical reactions at the melting point of rhodium. It suffices to announce that we hope in such conditions to realize a great number of reductions hitherto considered impossible, especially the reduction of baryta by carbon, boron, &c. We desire here only to claim priority for these experiments and to give ourselves the opportunity of continuing them long enough for the complete development of all the facts.

upon him. He then felt in his eyes a pain equivalent to that of a severe blow. The osmium, reduced on the surface of the conjunctiva, does not subsequently disappear, and so contributes to render the sight indistinct. We conclude from these experiments, that at the melting point of iridium, when platina itself vaporizes, osmium becomes volatile. But even then the practiced eye which follows attentively the phenomenon cannot detect in the osmium which rapidly disappears, the slightest trace of fusion. Osmium must be heated in vacuo, by the aid of a powerful voltaic current, before the problem can be definitely solved.

Experience has taught us that the maximum temperature which can be obtained with explosive gases, is obtained by mixing them in advance and burning them at the extremity of a blowpipe, at a distance of 3 or 4 millimetres at most from this extremity. To determine without danger to the operator, these favorable circumstances, we have contrived the following little instrument.

FIG. 2.



The gases, produced directly or contained in gasometers, are separately introduced into an apparatus, the interior volume of which is so small that the report of the explosion is scarcely perceptible, and all danger is avoided.* The hydrogen gas arrives by the stopcock H, and passing through the socket D, expands in a tube of caoutchouc in the interval, H′, whence it arrives by a second socket, E, in a bent tube, O′ E′ B, where it is mixed with oxygen. As to the latter, it enters by the stopcock O, passes by the socket E, in a special copper tube which opens in O″, where the gas is mixed with hydrogen. The explosive gas is lighted in B at the extremity of a large button of copper, strong enough sufficiently to chill the gas. With a little skill, this blowpipe can be held by the socket, D, with the same hand which regulates at will the two stopcocks, O and H.*

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* One of us brought back from London, in 1856, a beautiful instrument made by Mr. Ansell, which gave us the idea of our apparatus The blowpipe of Mr. Ansell, more complicated, less portable, but more elegant, is admirably suited to demonstrations in an amphitheatre.

MM. Thenard and Dulong had already found that osmium possesses the same property which they established for platina, of determining the combination of substances by mere contact with the reacting matter. We have established the existence of this property not only in osmium, but also in the other metals of platina, in which it exists to a very marked degree.

The spontaneous decomposition of sulphide of osmium by heat can be demonstrated by the experiment we have related, in which we prepared osmium by calcining the sulphide in a charcoal vessel. But as it might be supposed that the affinity of carbon for sulphur determined this reduction, we put the sulphuret in an earthen crucible enclosed in one of charcoal, which exhales no hydrogen gas, as may be the case in brasque of wood charcoal, and which hinders the roasting of the sulphide. In such conditions the decomposition of the sulphide of osmium is readily accomplished. This observation is equally applicable to gold as well as to the other platinoid metals, and we shall find that it has great interest for us, because we base upon this curious property one of the methods of separation employed by us for the analysis of the ore and residue of platina.

*Osmic Acid.*—Dry osmic acid is easily prepared by the roasting process indicated by M. Fremy, which succeeds sometimes well, sometimes ill, according to the nature of the osmides. When these roast easily, this method must be employed as its author has described it. If not, the osmides are rendered easy of oxydation by destroying their aggregation in the following manner: The osmides are mixed with eight or ten times their weight in zinc, and the whole digested for several hours at bare redness; when the solution of the osmium in the zinc is complete, the alloy is treated with muriatic acid, which leaves a powder so combustible that it gives off osmic acid at the common temperature, and takes fire at about 400°, giving off osmic acid and oxyd of zinc. It is even necessary, before introducing this powder into the apparatus of M. Fremy, to calcine it to dull redness to diminish its combustibility. This powder is a mixture of finely divided osmium and an alloy of iridium and zinc, in which, consequently, the primitive elements of osmium are entirely separated. The following results were obtained with osmides rich in osmium.

---

* The maximum temperature is reached when the two gases burn without making the least noise. With an excess of hydrogen the flame *blows*, (*souffle;*) with an excess of oxygen it *whistles*, (*siffle.*)

Osmide in scales treated with zinc, gave a compound of

| | | |
|---|---|---|
| Osmium and iridium, | 82.6 | |
| Zinc, alloyed with iridium, | 17.4 | |
| | 100.0 | |
| Loss of osmium by wasting, | 30 | per cent. |
| Corresponding osmic acid, | 39.7 | " |

Russian osmides in grains, which yielded no osmic acid by roasting, can furnish 18 or 20 per cent. of it after being disaggregated by zinc. We find, moreover, on applying the most delicate tests for osmium, that osmides thus treated retain but insignificant traces of this metal.

*Density of the Vapor of Osmic Acid.*—The formula of osmic acid, $Os\,O_4$, which really plays the part of an acid, has a sort of exceptional composition among the acids now known to us; so that it was of some importance to determine the density of its vapor, which is moreover, an easy task, since osmic acid boils at about 100°, is readily manipulated, and can be obtained in a state of perfect purity.

We have prepared osmic acid by the process indicated by Berzelius, that is, by roasting pure osmium in oxygen. It was introduced into a balloon with a long neck, full of dry and weighed air; the neck is then drawn out, and the useless parts cut away, returned to the balance. The balloon, introduced into an oil bath, was raised to 245.2°, (246° corrected,) and the following results were obtained :

| | | |
|---|---|---|
| Temperature of the balance, | 19° | |
| Pressure during the operation, | 764.55 | millimetres. |
| Temperature of the barometer, | 16.° | |
| Temperature of the oil bath, | 245.2° | |
| Excess of weight, | 1453 | milligrammes. |
| Residual air, | 0 | |
| Volume of balloon, | 299 | centimetres. |
| Weight of the litre, | 11.48 | grammes. |
| Density, | 8.89 | |

The temperature of 246° is sufficiently above the boiling point of osmic acid to allow us to rely on this experiment. Nevertheless, we concluded to recommence the operation at a temperature notably higher, to determine that this acid is not in the category of acetic acid, and to guard against the cause of error pointed out by M. Cahours[*]

The following are the new elements:

| | | |
|---|---|---|
| Temperature of the balance, | 19.5° | |
| Barometer at the moment of the tare, | 762.5 | millimetres. |
| Temperature of the barometer, | 17.5° | |

---

[*] The peculiarity alluded to is that the density of acetic acid vapor, determined at 152°, is 2.78, corresponding to 3 volumes ; whereas, when determined at 230°, it is 2.09, corresponding to 4 volumes.—*Translator.*

| | | |
|---|---|---|
| Barometer at the moment of closing the balloon, . . . | 762.2 | millimetres. |
| Temperature of the barometer, | 17.5° | |
| " of the oil bath, . | 285.0° | |
| " " corrected, | 286.0° | |
| Excess of weight, . . . | 977 | milligrammes. |
| Residual air, . . .. | 1 | cubic centimetre. |
| Volume of balloon, . . | 220 | " " |
| Weight of litre, . . | 1147 | milligrammes. |
| Density of vapor, . . . | 8.88 | |

that is identical with the first determination.

The density calculated by the formula,

$$131.5 \times 0.0692$$

gives the number 9, which is, it is true, very near 8.9. These numbers prove that osmic acid, $OsO_4 = 131.5$, represents two volumes of vapors, a fact which is remarked in a great number of volatile matters in mineral chemistry.

Although the numbers 8.859 approximate closely, they differ in an unusual way, since the number determined by experiment is commonly larger than the theoretic amount: we must therefore admit either that there is a disturbing cause peculiar to osmic acid, upon which this difference depends, and which we may have neglected, or else that the equivalent of osmium should be slightly lowered. There is no other apparent cause of error in this operation; no reduction of osmium, every thing remaining in the balloon being either crystallized or gaseous. A remarkable peculiarity is observed at the moment the balloon is opened under mercury. By contact with osmic acid, the mercury acquires the property of moistening the glass, and the balloon is perfectly coated with reduced osmium, or rather with an amalgam of that metal.

(Continued in our next.)

ERRATA.—The translator not having seen the proof of the first part of this article, finds that some errors have been made in the proper names, which the reader will please correct. Page 195, 10th line from bottom, for Kocksbarrow read *Kockskarrow*; next line, for Rochette read *Rachette*; 2d line from bottom, for Desmontes read *Desmoutes*; bottom line, for Pavard read *Savard*.

## ARTICLE VI.

### *The Salivary Glands.* By DR. GEO. C. DE MARINI.

AFTER mastication, the next chemico-vital process that takes place, is insalivation. This process is performed by means of a series of glands arranged at the sides and underneath the mouth. This series has relations of the greatest importance to the anatomist and dental surgeon. Their function is of particular importance to the animal economy, for, upon their healthy or disordered secretion depends a healthy or diseased state of the mouth. It is to these glands that we purpose to direct our observation in this essay. We will consider them first, in their anatomical relations; secondly, the chemistry of their secretion in a healthy and pathological state, and lastly, the effect of their altered secretions upon the teeth.

The glands which pour their secretions into the mouth are the parotid, submaxillary, sublingual, buccal, labial and palatine. Our description of them will be in the order in which we have mentioned them. The chief glands concerned in insalivation are the three first mentioned. Having corresponding glands on the opposite side of the inferior maxilla they form almost a complete chain around it. They are conglomerate glands with an investing membrane which dips down between their component lobes and lobules. The principal of these is the

### *Parotid Gland.*

This is the largest of the salivary glands, and is larger than all the rest together, and varies in weight from a half to one ounce; it is of a pyramidal form, the apex is inward and the base outward. It seems to be moulded like soft material into the pyramidal space formed by the surrounding parts. It receives its name from its position around the ear. Its coverings are the skin, cellular tissue, superficial cervical fascia, muscular fibres (which are a prolongation of the platysma myoides muscle,) and deep cervical fascia. The deep fascia extends upwards to the zygoma, backwards to the cartilage of the ear, and anteriorly beyond the edge of the masseter muscle. It sends prolongations into the substance of the gland, dividing it into lobes and lobules. The measurements of this gland are from the zygoma to the angle of the jaw from one and a half to two inches, transverse from one and a quarter to one and a half inch, from the integuments to the styloid process, one inch.

On account of the connection of the parotid gland with so many different parts, its relative anatomy is intricate. The anterior surface of the gland extends a little beyond the masseter muscle; this border is grooved to receive the ramus of the jaw; beneath, it extends forwards to the stylo-maxillary ligament which separates it from the submaxillary gland. The posterior surface extends to the cartilaginous portion of the meatus auditorius, and partly curves around it. It also comes in contact with the mastoid process and the posterior portion of the digastric muscle. Superiorly it extends to the zygoma and temporo-maxillary fossa; inferiorly, it fills the space between the angle of the jaw and the border of the sterno-mastoid muscle. The internal surface is very uneven, it fills up the posterior part of the glenoid cavity, surrounds the styloid process, and pterygoid muscles, and comes in contact with the pharynx.

The parotid gland is nourished by the external carotid artery. This artery enters the gland at its lower border, and becoming more superficial as it ascends, it breaks up in the substance of the gland, the final termination of it comes out of the gland near the ear, and ascends, forming the superficial temporal. The external carotid gives off, in the gland the internal maxillary, transverse facial, and posterior auricular.

The veins correspond to the arteries, have similar names and unite to form the external jugular.

The nerves, which are distributed to the parotid gland and integuments, come from the 5th, the portio dura of the 7th pair and cervical plexus: they form constant anastomoses with each other, and subdivide almost ad infinitum. The great auricular divides itself in the substance of the gland, sending off superficial branches and then passes out to the cheek, where it divides into superficial and deep auriculars. The auriculo-temporal arises from the superior maxillary and divides into the superficial temporal and the auricular branch; the latter enters the gland and sends off numerous branches anastomosing with other nerves.

The portio dura of the 7th pair after issuing from the stylo-mastoid foramen, sends off three muscular branches, and then enters the gland, where it divides into the temporo-facial and cervico-facial. These various branches of the portio dura anastomosing with those enumerated, form the plexus called *pes anserinus*. The nerves which form this plexus are the temporo-facial, the auricular branch of the inferior maxillary, and the cervico-facial.

The parotid is the type of the other salivary glands, and the description of the minute anatomy of one will apply with but slight exception to the others. It is a conglomerate gland, of an ash color, which exhibits a granulated appearance upon dissecting off the parotid fascia. It is composed of lobes which again are divided into lobules, and these are connected with each other by areolar tissue, vessels and ducts. The lobes vary in diameter from one-eighth to one-fifth of an inch, and the lobules composing them, measure in diameter from $\frac{1}{50}$ to $\frac{1}{100}$ of an inch. Each lobule consists of numerous closed vesicles, which open into a common duct. This arrangement has been compared to a bunch of grapes upon its stalk. Each grape, with its stem might represent a lobule with its duct, whilst each stem running into a principal stem, and then into the vine, would represent the combination, and course of the ducts.

The wall of each vesicle is formed by delicate basement membrane lined with epithelium and covered with dense capillary net work. Between the lobules we find cellular tissue, in which are found a few lymphatic glands. These lymphatics are sometimes the seat of inflammatory disease and they may become sufficiently enlarged to destroy the gland. The ducts of the separate lobules combining, discharge themselves into a common duct. This arrangement was first described by Needham and afterwards by Stenon, and is now entirely known by the last name. Stenon's duct is then an aggregation of smaller ducts, and leaves the gland at its superior and anterior part, whence it slightly descends and is followed by small filaments of the portio dura nerve. It crosses the masseter muscle, and passing between the fibres of the buccinator enters the mouth at an angle. The mucous membrane of the mouth forms a valve over its orifice, it also lines the duct, and is continued up as far as the terminal vesicle. In mastication, the saliva is forced out partly by the contraction of the fibres of the buccinator and masseter, and partly by the mechanical pressure of the food. The determination of the exact position of Stenon's duct is at times necessary. It may be found by drawing a line from the ala of the nose to the lobe of the ear. To locate the duct, another line must be drawn from the inner canthus of the eye to the anterior and inferior edge of the masseter muscle; the intersection of these two lines is the point at which it perforates the buccinator. The duct of Stenon is composed of mucous membrane and an elastic coat surrounded by areolar tissue. This areolar tissue, as we before said, separates the lobules and contains the ultimate distribution of the blood vessels.

The next salivary gland in its anatomical position and in size, is the

### *Submaxillary.*

The description of the minute anatomy of the parotid, will apply to this gland, with the exception that the lobes are somewhat larger than the former, its investing membrane is also less dense. This gland is situated in the supra-hyoid region, in the anterior part of the submaxillary angle of the neck. It is of an irregular form, and weighs about two drachms. Its relations with the surrounding parts vary according to the position of the head and lower jaw. When the lower jaw is depressed it lodges in a space, where it is almost hidden by the inferior maxilla. When the head is thrown back it becomes much more external and seems to belong more to the supra-hyoid than to the submaxillary region. Its coverings are, integument, platysma myoides, deep cervical fascia, and when the chin is depressed it is protected by the lower jaw. It lies upon the mylo-hyoid, hyo-glossus and stylo-glossus muscles, a part of the gland passing beneath the posterior border of the mylo-hyoid. Posteriorly it is separated from the parotid by the submaxillary ligaments and anteriorly it is separated from the sublingual by the mylo-hyoid muscle.

The arteries of this gland come from the facial and lingual. The facial lies in a groove at the posterior and upper border. The nerves are derived from the submaxillary ganglion, from the mylo-hyoid branch of the dental and partly from the sympathetic. The excretory duct of the submaxillary gland is called the duct of Wharton.

Like Stenon's duct it is formed by a union of the small ducts of the lobules. The duct leaves the gland at its anterior extremity and is directed obliquely upward and inward, parallel with the hypoglossal and lingual nerves. It first passes between the mylo-hyoid and hyo-glossus muscles, and then between the genio-hyo-glossus and sublingual gland; at this point it then passes between it and the mucous membrane of the mouth, it perforates the mucous membrane and opens by a narrow orifice upon a papilla, behind the incisor teeth. The duct is almost two inches long, is much thinner than Stenon's, and yet much larger in proportion to the size of the gland.*

### *The Sublingual Gland*

Is the third and smallest of the salivary glands. Its general anatomical characteristics are similar to the others. Its weight about one drachm. It is situated directly beneath the mucous membrane of the mouth on each side of the frœnum linguæ, it is here also in contact with the inner surface of the jaw near the symphysis. Interiorly it is in relation with the genio-hyo-glossus muscle from which it is separated by the lingual nerve, and also with Wharton's duct. Its anterior extremity is in contact with its fellow of the opposite side. Behind it touches the deep part of the submaxillary gland. Its excretory ducts, sometimes called the ducts of Rivinus, open into the mucous membrane of the mouth along the sublingual crest. Others again open directly into Wharton's duct. The arteries of this gland come from the submental and sublingual. The veins have the same name. Its nerves are numerous branches of the gustatory.

### *The Labial, Buccal and Palatine.*

The next glandular series connected with insalivation, are found under the mucous membrane of the lips, cheeks and palate. These minute glands form a layer between the mucous and muscular layer of the structure forming the oral cavity. They are different from the muciparous follicles and are true salivary glands. They are distinct, spheroidal glands, and have secretory ducts opening upon the mucous membrane of the mouth ; the orifices of their ducts produce a perceptible elevation of the mucous membrane. These congregations of salivary glands are called as above. The nature of their secretions will be considered under the head of saliva.

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* For some further particulars relative to the anatomy of this gland, see the "Description of Plates."

The great function of all these glands is the secretion of saliva.

Our attention will now be directed to this secretion, and will embrace its chemical and physiological action; we will also notice some of the pathological changes it undergoes, and the effect of those changes. The saliva differs in density and manner of discharge in the various glands.

The secretion of the parotid gland discharges chiefly during mastication or irritation of the mucous membrane of the mouth, while the submaxillary and sublingual are continually pouring out. The saliva of the parotid then has been named the "saliva of mastication."

The secretion of the other glands is much more tenacious and seemed to serve the purpose only of lubricating the food and facilitating deglutition. It has been called the "saliva of deglutition." The differences mentioned concerning these secretions, was discovered by alternately tying the excretory ducts of the salivary glands of animals. That the functions of the two varieties of saliva are as stated, is confirmed by comparative anatomy. Animals which masticate their food have large parotids, and those that merely lubricate their food before swallowing it, have large submaxillary and sublingual glands.

### *Chemistry of the Saliva.*

It is difficult to obtain a sufficient quantity for analysis, and to get it pure and free from epithelial scales. It should be obtained from fistulas. Saliva is a clear, colorless and viscid fluid. Upon standing, it separates into an upper stratum of clear fluid, and at the bottom another stratum of denser fluid, and of course not so transparent. The lower one contains epithelial scales. The specific gravity varies from 1004 to 1009. The reaction of saliva is usually alkaline, but this is subject to variation. Analyses of saliva have been made by most of physiologists.

We give two of the most reliable:

DR. WRIGHT, *of London.*

| | |
|---|---|
| Water, | 988.1 |
| Ptyaline, | 1.8 |
| Fatty acid, | .5 |
| Chlorides of sodium and potassium, | 1.4 |
| Albumen with soda, | .9 |
| Phosphate of lime, | .6 |
| Albuminate of soda, | .8 |
| Lactates of potash and soda, | .7 |
| Sulphocyanide of potassium, | .9 |
| Soda | .5 |
| Mucus with some ptyaline | 2.6 |
| | 998.8 |

BIDDER AND SCHMIDT.

| | |
|---|---|
| Water, | 955.16 |
| Organic matter, | 1.34 |
| Sulphocyanide of potassium, | 0.06 |
| Phosphates of soda, lime and magnesia, | .98 |
| Chlorides of sodium and potassium, | .84 |
| Mixture of epithelium, | 1.62 |
| | 1000.00 |

The variations in the results of analyses of saliva may be on account of changes in the secretion, for it is certain that the secretions vary according to the state of general health, the condition of the brain and nervous system, and perhaps the character of the food.

The presence of the sulphocyanide of potassium in the saliva is somewhat remarkable, as it exists in none of the other secretions. It has been since its first discovery, a question whether it is a normal or pathological element of the saliva. Mr. Longet in the "Comptes Rendus" in

1856, gives very conclusive arguments in favor of its normal existence. His chief arguments are that it is found in the secretions of all of the large salivary glands. That it is found universally when the proper tests are applied. That, where it has not been discovered, a proper degree of concentration of the saliva was not obtained, and that it exists without regard of changes in the teeth. Its effect upon the animal economy and the reason for its presence only in this secretion have not been ascertained.

It has been asserted by some physiologists, and among them by Wagner, that the saliva has no important digestive function. His conclusion seems to be mainly drawn from the fact that food placed directly into the stomach was as readily digested as if it had been mixed with saliva. Experiments upon it, isolated from other fluids of the body lead to a different conclusion. Although it must be said that it has not been positively proved to be absolutely necessary to digestion.

The results of experiments made upon saliva out of the body, are briefly these. It was found to convert starch into sugar; the transformation being so complete that iodine would not detect the least trace of starch in the mixture. These effects required the combined fluids of the mouth and did not produce the same effects when the saliva of the larger salivary glands alone was taken.

The test for detecting starch is to add iodide of potassium, and afterward nitric acid. Iodine will always show a blue color when acting upon starch. In this case the nitric acid unites with the soda, setting the iodine free.

To find whether sugar exists in a mixture, Trommar's test is the most delicate. It is composed of sulphate of copper, tartrate of potassa and potassa fusa; these are dissolved in water. When added to the liquid to be tested, they impart a blue color to it which upon the mixture being boiled, turns to yellow if sugar be present, this substance reducing the oxyd of copper to the red suboxyd.

Dr. Wright, of London, found that this property of converting starch into sugar was increased by impregnating it with oxygen. Saliva seems also to have a fermentative property. When mixed with meat and bread, and allowed to stand two days, it produced vinous fermentation. The same material when mixed with water and kept at the same temperature were found to decompose more readily.

These are the only positive chemical properties that saliva seems to have, and it may be doubted, until more light is thrown on the subject, whether, with this exception, saliva does more in the animal economy than to lubricate and soften the food, except that we admit that its antiseptic property is of importance. Experiments made upon animals with the salivary ducts tied, showed that the food becomes sour after being retained in the stomach a certain length of time. This, of course, would retard digestion and ultimately seriously affect the general health.

The characteristic ingredient of saliva is ptyaline; its presence is invariable and gives to saliva its peculiar smell. Ptyaline may be obtained as follows: Filter the saliva and treat the residuum with sulphuric ether, this will then contain the fat and ptyaline, evaporate and the dissolved fat is volatilized with the ether, leaving ptyaline. When obtained it is a solid, adhesive and yellowish substance, and has the characteristic odor of saliva. It may be preserved for some time without decomposition.

We will now leave the chemistry of healthy saliva and consider the morbid changes this fluid undergoes, only observing those changes which affect the teeth. Saliva may contain, as an abnormal constituent, any of the secretions of the body, and also any of its chemical constituents. This fact would vary the reaction of saliva, and thus we find it at times quite acid and at others unusually alkaline. It is evident that these two changes would produce an action upon the teeth, and we leave other morbid conditions and turn our attention only to these.

*Acid Saliva.*—The acids with which saliva has been found impregnated, are acetic, lactic, hydrochloric, oxalic and uric. The presence of these acids is invariably due to an altered state of the general system. Among the causes are fevers, especially eruptive fevers, rheumatism, gout, diabetes, and a disordered state of the digestive organs; the latter is no doubt the most frequent cause. The use of certain food and drinks will also produce acidity of this secretion.

The effect of acid saliva upon the teeth is active corrosion. The destructive power of acids upon the teeth is too well known to require repetition; the acid combines with the alkaline substance of the teeth and destruction of the enamel and bone takes place with fearful rapidity. It is a well known fact that if a tooth is placed in dilute acetic acid, it will in a short time entirely disappear. As a cause of caries, the skillful dentist should never overlook the state of the saliva, and a mild medical treatment might be instituted with his operations upon the teeth.

*Alkaline Saliva.*—This condition depends usually upon excess of soda; there is also an excess of albumen and the usual properties of the secretion are diminished. The causes of alkaline saliva are frequently depending upon disturbances of the nervous system; neuralgia, toothache, mental emotions, mania and epilepsy, are some of the causes of it. Ammonia is sometimes also a cause of alkaline saliva; but this is unusual, and when it exists the saliva has a most unpleasant taste and smell, it is diminished in quantity and becomes very viscid.

To the dentist an important variety of alkaline saliva is the presence of calcareous matter. This, of course, is one of the causes of alkaline saliva, and is the formative principle or element of salivary concretions.

These concretions are found in the tartar of the teeth and in salivary calculi. The chemical ingredient which is found to excess in these deposits, and in the saliva that causes them, is the phosphate of lime. Its normal proportion is 6 parts in a 1000, but when an excess over this takes place, accumulation of calcareous matter is the consequence.

Where there is an excess of this ingredient in saliva, the secretion shows it without the necessity of chemical analysis; it has a whitish appearance, different from the transparent of ordinary normal saliva, and its reaction is very decidedly alkaline.

The effects of calcareous saliva upon the teeth is known to all. It deposits its excess of earthy constituents around the teeth at their junction with the gums and fills any interstices that may exist in them. Any roughness or obstruction becomes a nucleus of deposit.

The teeth may be regarded as separate nuclei of deposit, but a collection in the salivary ducts is less easy of explanation. Fortunately they are rare, and when found, may be traced to some obstructing cause. Dr. Piggot gives an analysis of a calculus found in the duct of Stenon of a horse, which may be regarded as a chemical type of this class of calculi as found in the herbivora. The nucleus in this case was found to be a splinter of pine wood.

The result of analysis was

| | |
|---|---|
| Water, | 1.260 |
| Organic matter, | 8.350 |
| Lime, | 49.572 |
| Magnesia, | 2.820 |
| Alkalies, | .816 |
| Carbonic acid, | 31.702 |
| Phosphoric acid, | 2.320 |
| Silica, | .330 |
| Chlorine, | .747 |
| Sulphuric acid, | 2.019 |
| | 99.938 |

The excess of lime in this analysis is rather greater than is found in the analysis of salivary concretions in the human body, but may be taken as a standard on account of its completeness, by which we can more easily estimate the relative proportions of salivary calculi in other animals. The tartar of the teeth is the commonest form of salivary concretion. We give the analysis of this substance, made by Pepys and Dr. Dwinelle, of Cazenovia, New York.

| | Pepys. | Dwinelle. |
|---|---|---|
| Phosphate of lime, . . | 35 | 60 |
| Carbonate of lime, . . | | 14 |
| Fibrin, or cartilage, (?) . | 9 | |
| Animal matter and mucus, | | 16 |
| Animal fat, or oil, . . | 3 | |
| Water and loss, . . | 3 | 10 |
| | 50 | 100 |

Ptyalin has also been found as an element in salivary calculi. Its presence is not invariable.

Having concluded the anatomy of the salivary glands, the physiology and chemistry of the saliva, we will make a brief notice of the diseases that the glands are liable to. For this purpose we will again take the parotid as a pathological type. The lymphatic glands may become diseased and enlargement to an extraordinary degree may be the result. They have become sufficiently enlarged to cause absorption of the gland itself.

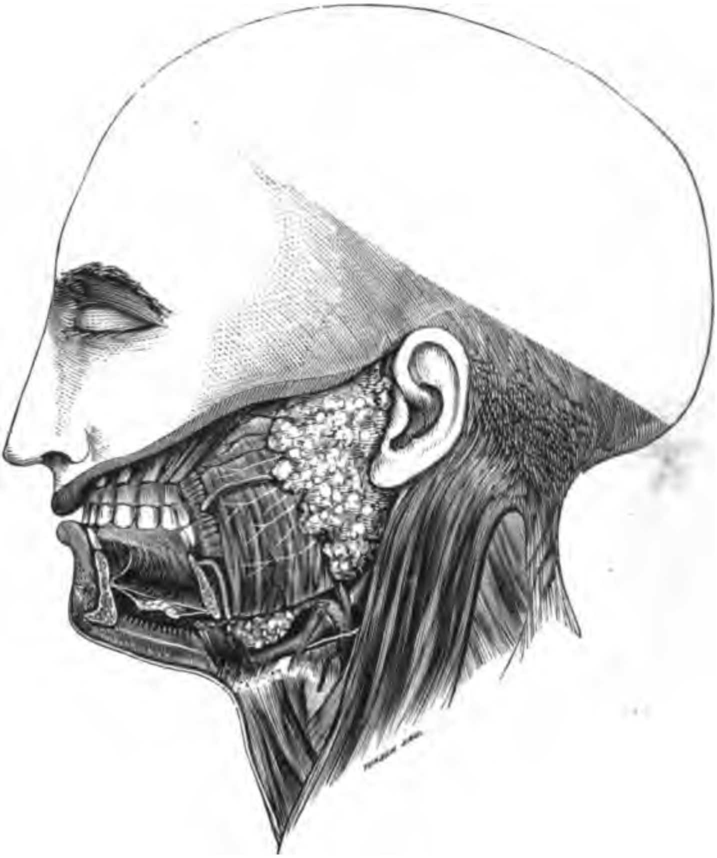
*Parotitis* is the most ordinary form of disease of this gland. A similar inflammation sometimes affects the other glands.

*Induration* may take place as the result of inflammation and depends upon an interstitial deposit of lymph.

*Abscesses* are of frequent occurrence and usually form under the internal fascia, and are the cause of intense pain.

*Scirrhus* is the gravest disease which the salivary glands are liable to. Its existence is indicated by an irreg-

**PLATE 2.**



## PLATE 1.

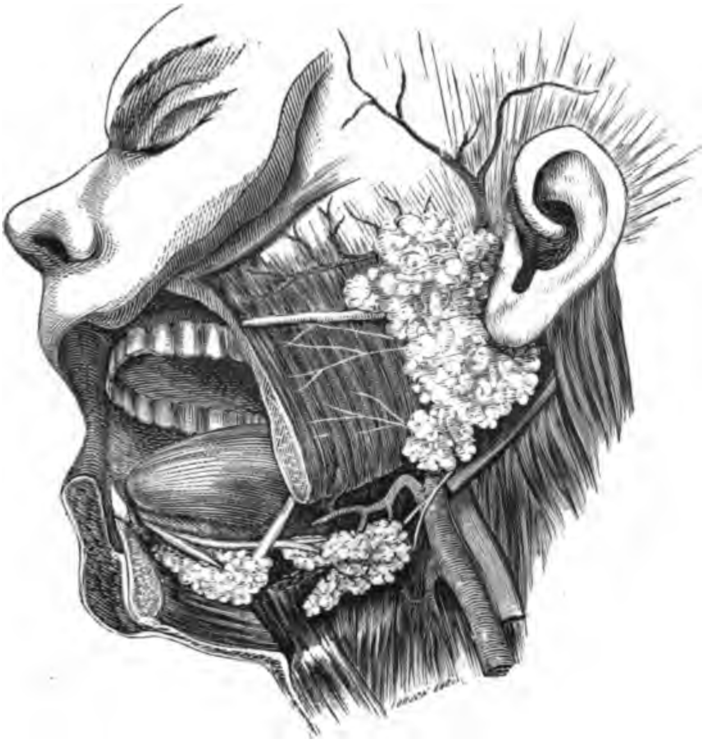


PLATE 3.—FIG. a.

FIG. b.

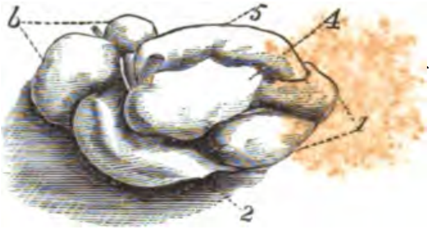


FIG. c.

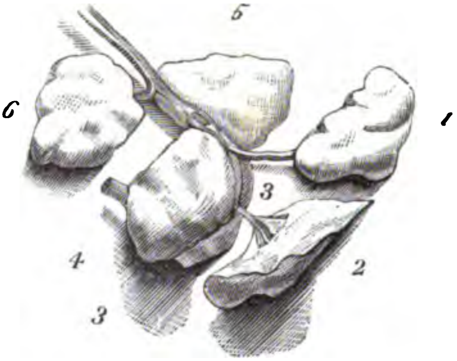


FIG. d.

ular and intensely hard swelling with clefts and globular projections on its surface, accompanied by lancinating pains, and the ducts have a firm, round feeling under the finger.

*Sarcoma.* In this form of disease the gland is also enlarged, but the growth is more rapid than the last, and it is less lobulated and has not that firm feeling of the former.

Beside these diseases we may find degeneration of tissues, as fatty and encephaloid degenerations, tumors in the substance of the glands, fungous growths, &c., &c.

With these very imperfect and hastily gathered observations I leave the subject. Not that I have by any means completed it, but collecting notes and verifying anatomical plates by dissections, consumed the time that might have been devoted to a better arrangement of my materials and a clearer statement of facts.

## *Description of Plates.*

### PLATE I.

Is a copy of the illustration of the glands from Gray's Anatomy. As his plate has in some respects a distorted appearance and does not represent the natural proportion of the glands, I made a dissection, which Plate II represents.

### PLATE III.

*Fig. a*, represents the right submaxillary gland, as it first appears on dissecting, of natural size and invested by its membrane.

*Fig. b.* The same taken out, divested of its membrane and seen from above. I find it is composed of six distinct lobes.

*Fig. c.* The same with the lobes stretched apart to show their relative size and form. This figure also shows the principal ducts, arteries and veins. No. 6 is the part which passes beneath the posterior border of the mylohyoid. The lobes numbered 1, 2, 3, 4 and 5, are nourished by a branch of the facial artery, whilst lobe 6 receives a branch from the lingual.

*Fig. d.* The facial artery of natural size as it appears injected. The branches go to the lobes with corresponding numbers.

# ARTICLE VII.

## *Anchylosis of the Jaws from a Semi-Cartilaginous Band Connecting the Upper and Lower Jaws.* By DR. J. L. LEVISON, of London.

SOME years since, during a hurried visit to Cheltenham, I was asked by a relative of mine to see a friend of hers, "who had some extraordinary growth in her mouth, which effectually prevented her from opening her mouth."

On the following day the lady was introduced to me, when I made a careful examination of her mouth, the particulars of which I shall now detail:

Mrs. A. J., a married woman, about forty, (without any family,) and of a nervo-bilious temperament; in her appearance there was nothing to indicate any abnormal tendency, and her particular annoyance was only manifested when she attempted to answer some questions put to her. I found on the left side of her mouth a strong semi-cartilaginous band, which seemed to originate in the upper jaw. The situation of this band being about an inch from the corner of the mouth and the insertion of the buccinator muscle near the dens molars, and probably also intimately connected with the masseter; as the latter arises by strong tendinous and fleshy fibres from the superior maxillary bone, where it joins the os malæ, the whole length of the inner edge of the zygomata. And the probable connection of the band with the latter muscle may be fairly presumed, as the outer part of the masseter stands backwards, and the inner part forwards, and in some measure decussating each other. In its descent it covers the coronoid process under the temporal muscles to be inserted in the angle of the lower jaw, and from upwards to the outside of the coronoid process.

The probable origin of this pseudo-growth may be further confirmed by the fact, that the action of the buccinator is to draw the mouth backwards and outwards, and to contract the cavity by pressing the cheeks inwards; whilst the action of the masseters is to raise the lower jaw, and pull it backwards and forwards, according to the direction of the fibres of these muscles.

We may now speak of this freak of nature and point out the many annoying consequences it induced.

The poor creature's teeth approximated so closely that she could neither cut, tear, or grind her food, and had to live on slops; besides this her pronunciation of words was seriously defective.

The first defect was attempted to be obviated by the extraction of an upper and a lower molar, on the opposite side of the mouth at which the band was situated, for the purpose of expediting, by means of a curved tube, her capacity of receiving mucilaginous and other nutritious fluids.

But little advantage actually resulted, and for this reason: that it is essential, in order to produce a vacuum, for the purpose of deglutition, the lips should be closed, and the soft palate pressed up behind the nasal fossæ, and then both fluids and solids are propelled onwards and received into the pharynx, and then the final act of swallowing takes place by the action of the muscles of the latter organ.

The cause of her defective speaking is also worthy of a passing notice. She spoke precisely like a person who has a fissure in the palatial bones, as in congenital hare-lip; in which case the bones are more or less separated, and the pronunciation is more or less implicated.

In the normal state of the vocal organs, when the air inspired by the lungs is used to form the vocal sounds—during the act of expiration, the different organs of the buccal cavity modify and individualize each kind—as the teeth, lips, and the palate, producing dentals, labials, and palatials, and these elementary sounds are combined, their compounds are the dento-labial, dento-palatial, and so forth.

But in the attempted speech of Mrs. A. J., the sounds passed from the back of the mouth through the nostrils, and these sounds were, consequently, as indistinct as if she had had a congenital defect of the ossa-palati, to a considerable degree.

What tended to make her speech appear to be defective from this cause simply, arose from the fact, that in cases of fissures of the palate there is observed a curious attempt to compensate for the condition of the sounding board, as the roof of the mouth has been called; this compensation enables an individual so circumstanced to obtain a perfect volition over both nostrils, so that in the utterance of the palatial or dental sounds—the nostrils are brought down so forcibly as to prevent any escape of the expelled air. This capability is another instance of the wisdom and goodness of God—that he has given a plasticity to different organs under any abnormal condition, whether the result of primary defectiveness, or from some casualty, so as to modify some of the ill consequences which otherwise would have been greatly aggravated.

There was, therefore, a great difficulty to understand Mrs. A. J., as she spoke with a constant snuffle, and with the wings of the nose so compressed, as to impart an unpleasant appearance to one who had, otherwise, agreeable features. Had it not been so, I should have made a more searching examination in order to elicit some information from her as to what she attributed the original cause of the formation of the band. But under the circumstance of her imperfect utterance, she either could not, or would not assist me in forming anything like a correct *diagnosis.*

Nevertheless, being satisfied that the band might be safely separated, I proposed that she should visit me at Brighton, (where I then resided,) when I proposed to operate on her and remove the band without much pain or any danger. And that to ensure both, I would place her under the medical treatment of my friend, Dr. Peckford. And further explained to her that my object would be, not only to remove the band, but to prevent its future growth.

She said, "I have the greatest confidence in your judgment, for your opinion exactly coincides in every particular with the opinion given to me by the late Mr. Liston, whom I consulted about a fortnight before his death. He told me at the time, that being much engaged, he would prefer seeing me on a future day, as a little delay would not render the operation more difficult.

But it appeared that before the period he had appointed to see her again, that gifted surgeon had paid the debt of nature, and his death had caused her great sorrow; for she had to return to Cheltenham without the object of her visit to the metropolis being effected.

If I could have operated at the time I first saw her, she would have submitted most cheerfully, but my engagements prevented my remaining a sufficient time either to do her or myself justice: and I have since regretted that I did not make some sacrifice, as the result would have proved a great blessing to the sufferer.

However, prior to my leaving Cheltenham, she made a definite engagement to pay me a visit. But she did not keep her word. And I was subsequently told that this arose from her being influenced by the dentist who had previously attended her, and that he had persuaded her to see once more a resident surgeon.*

The gentleman she consulted had previously attended her, and I am not aware whether he did or did not object to an operation, but he did not seem much inclined to remove the band, probably because the patient herself was, at the time, in a very highly nervous condition. So he substituted a mechanical contrivance, but for what object I cannot opine. As any force which could be applied without immediate danger would not have prevented the anchylosis, so long as the resisting cartilaginous band remained.

This instrument I subsequently inspected. It was of a wedge form, being made of two steel portions, graduated, so as to be flat and thinnest at the edges. The flat ends were perforated with holes, for the purpose of being covered with white kid leather. A screw was placed through the upper half of the wedge, to terminate into a cup-like female screw, affixed to the inner part of the lower half of it; and so contrived that the spaces between the edges of the wedge could be enlarged at the will of the patient. The edges of which were inserted or rather forced between front teeth.

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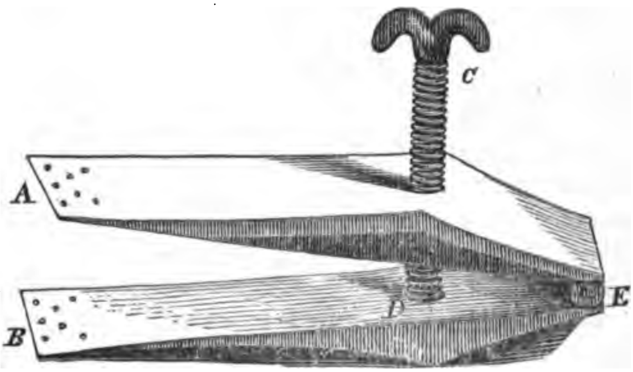
* This gentleman's name was S., and he has since then departed from this world, rather prematurely, for he was a young man.

*The Instrument for forcing the Jaws asunder.*



A The upper portion of the wedge, perforated with holes to enable the edge to be covered with kid leather.
B The lower half of ditto.
C Movable screw to adjust the space.
D The female screw (cup-shaped) on the inner flat side of the lower half.
E The joint.

Mrs. A. J. persevered for two months in using this instrument, until she experienced great agony, and not finding the slightest improvement, she abandoned its use altogether. And when the nature of the strong resisting band is taken into consideration, and that it utterly prevented the action of the *temporales* and *masseters*, no other result could have been anticipated.

Soon after this experiment, I received from my correspondent a reply to certain queries of mine, and among others the following:

"Mrs. A. J. has been very ill this winter from an enlarged lung on one side, and under the slightest cold she is incapacitated to speak, even in her usually imperfect manner. She is now suffering from bronchitis, and looks very ill and much emaciated."

It seems to me not improbable that the wedge was intended to gradually separate the jaws, being forced between the teeth; and it may be presumed that the pain she complained of whilst wearing the instrument, had induced a *chronic* inflammation of the integuments and muscles of the buccal cavity, causing both the latter to become thickened, so far as may be judged of from her subsequent symptoms, and the results.

I saw her again, about two years after the wedge experiment, and my own first examination, (now about six years since,) and found the band, instead of being separated from the inner portion of the cheek, so to admit the finger passing freely between it and the band, the latter had become so perfectly united with the cheek, that it would now be impossible to do any good by any attempt to separate it; and it could only be removed by dissecting it away from the cheek to which it is incorporated, and in so doing, as it is merely covered with the integument, any operation might tend to induce another very unpleasant deformity.

The last spring, having had occasion to visit Cheltenham again, on a melancholy bereavement of one of my family, I took the opportunity of once more examining the patient, and now feel assured that any operation would be attended with some danger.

The jaws are perfectly immovable, and the *anchylosis* is complete. And although she lives altogether on suction, yet she looked better in health than I had anticipated. There is, however, every probability that she may ultimately die from actual inanition.

As my object in giving publicity to this *unique* case is for the purpose of obtaining some information on its probable origin, I shall conclude, therefore, this brief paper with a summary of an article on anchylosis of the alveolar arch, in Oppenheim's Zeitschrift Band, 44, page 375, as given in the xviith number of the Medico-Chirurgical Review, for January, 1852.

The writer says, "anchylosis of the lower jaw may occur in three localities. 1st. The head of the condyle may become fixed in the glenoid cavity. This form is the most frequent, examples of which are recorded by Sandifort, Blandon, Cruvelhier, Howship, Holcher, Hyrtle, and others.

"2d. The coronoid process may become attached to the zygomatic arch, of this two cases are recorded.

"3d. The alveolar process may become conjoined.* Of this form there are examples besides the one recorded by Dr. Werner, which is now cited. "S. R., at twenty-three; when three years old he underwent severe salivation, after which his jaw remained in a fixed state. Notwithstanding the absence of masticatory powers, he was well nourished. The jaw was quite immovable, firm pressure or traction exerting no effect on the condition of the teeth. The *incisores* and *molares* were indeed for the most part wanting, the roots of which did exist, projecting beyond the alveoli of the diminutive jaw bone. The jaws were so far separated, that with some trouble, a little finger could be introduced in front, but from the anterior on each side backwards, bony arches connected the upper and lower jaws. The buccal mucous membrane was attached to the gums at the edges of these arches, but the temporal and masseter muscles remained free.

"Speech much resembled that which takes place with the mouth closed; and food which did not require mastication was introduced between the defective teeth.

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* I have seen a preternatural growth of gums, which gums have completely hidden the teeth, falling down over them like a curtain. In this disease of the *alveoli*, they seem to suffer also from an abnormal growth.

"To remedy this state of things, the gums were separated by an incision from the cheeks to the lips, and a broad portion of the connecting arch on either side removed by a small saw. The jaws could not be expanded by the aid of a mouth speculum, to the extent of half an inch, some painful stretching of the muscles being induced. The patient was, however, enabled to voluntarily close the mouth again—proving that more than twenty years' inactivity had not destroyed the functions of the joints and muscles. After several weeks perseverance in gradual dilation, a still wider expansion was obtained, enabling the patient to chew food that was not too hard, which indeed the loose state of his teeth prevented from biting."

[Vide Medical and Chirurgical Review.]

Mrs. A. J. was, in all probability, more than thirty before the band was formed, and now, after the lapse of so many years, there is every probability that both the muscles and joints in her case are implicated.

As, therefore, *anchyloses* of the jaws are rare, even when dependent on morbid growth of the alveoli, or the union of the coronoid process in the glenoid cavity, little can be known of their special pathology, and in the case of Mrs. A. J., (now first reported,) it being altogether an isolated one, the difficulty is still greater. 1st. As to origin of the band, and what predisposed its peculiar formation. But we have *data* to indicate the cause which aggravated the inconvenience and destroyed all chances of cure; namely, the pressure and force of the machine, and the consequential adhesion of the band to the cheek itself, from which it had been previously separated. Those who are acquainted with the organs of the buccal cavity, and particularly those who supply artificial teeth, know that often, in narrow jaws, (commonly spoken of as rabbit mouthed,) that elastic springs will often excoriate the inner surfaces of the cheeks, and that an inflammatory condition thus set up will affect the *temporales*, &c., by sympathy, causing much pain to the patient. Hence the mechanical force induced by the wedge instrument, not only caused inflammation of the muscles and the integuments of the cheek, and by thus thickening them, point out with certainty why now the band and cheek are so intimately united. And that though when not so connected, there would not have been any danger to operate, that now it would be dangerous to attempt any.

## ARTICLE VIII.

## *A New Method of Making Dies.* By F. Y. CLARK, of Savannah, Ga.

To view comparatively the process for obtaining metallic dies, which we now offer the profession, we might speak at some length of the many objectionable features in connection with the various plans now in use; but, as we are addressing the experienced practitioner more than the student, we trust that these features are sufficiently familiar and understood to need no more than a mere allusion.

We believe there are very few, if any, who have not felt the want of a less tedious, more accurate, and simple process, while going through the disagreeable list of difficulties and manipulations, such as varnishing and oiling impressions, taking and trimming casts, varnishing again, and moulding in sand, using flasks and similar auxiliaries. If an irregular, prominent, or diverging alveolus is presented, a little skill and the yielding nature of the membrane will always enable us to secure a good impression; but, by our usual mode of procedure, a perfect metallic die of that impression is impossible. We may consume time, weary our heads and hands with flasks, pour the metal on our cast, or dip the cast in the metal, yet withal, as the principle is incorrect, the result must be the same.

We are confident that the most experienced portion of the profession will fully coincide with us in saying that what is wanted *is some simple method by which the metallic die can be taken directly from the impression.* Plaster comes nearer to what is wanted in this respect than any thing else in use, but were we to pour metal into a plaster impression, we know that the moisture would destroy the die: and to attempt to drive off this moisture by heat, would prove equally fatal to the impression. To accomplish our end, then, we found it necessary to forsake the beaten path pursued for years, and start anew, to seek some material, or combination of materials, by which we could secure a perfect impression, and which would resist the amount of heat necessary for obtaining a metallic die.

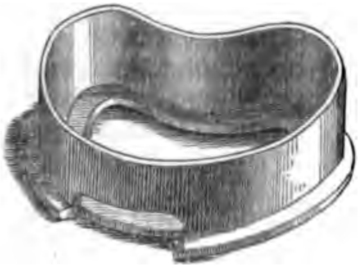
During the last three or four years our experiments to this end have been numerous. After testing from time to time, with more or less success, one material after another, and finally securing a combination that met our most sanguine expectations, we then found it necessary to construct a cup and flask, or set of flasks, by which this could be conveniently and successfully used for the end in view. In doing the latter, we have had much trouble, and spent much more time and money than many would suppose. We have gone from sheet iron, forced in shape by wooden forms, to copper struck up by iron dies, and then to various kinds of castings, until we arrived at that which we now offer, and which we believe, after being once fairly used, will never be thrown aside for any other method now in vogue.

With those prefatory remarks, we submit the following process, which we hope will be found as successful in the hands of others as it has been in our own:

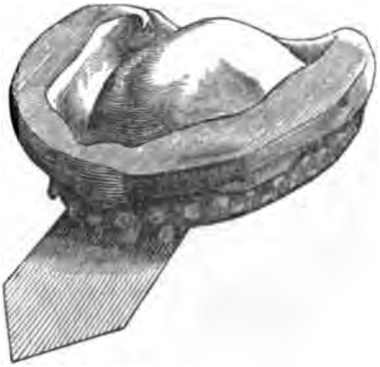
To commence, it is necessary to have an impression-cup made from brass, German silver, copper, or any other metal that will stand the necessary amount of heat for obtaining a metallic die without change: we prefer one made from copper, because this metal is more malleable and easily cleaned after using, than any other that we have tried. It should differ in no other respect from the ones in general use, except in the perforation of holes all over its surface, about one-fourth of an inch apart, and one-eighth of an inch in circumference. These holes are very essential, for they not only prevent the material from leaving the cup in removing it from the mouth, but greatly facilitate the escape of moisture in drying or on receiving the metal for the die. With a cup as described, we use a batter composed of equal parts of clear, white spar and the best calcined plaster of paris. The manner of taking an impression with this batter is nearly the same as with plaster alone. It should be mixed somewhat thicker at first than plaster-batter used for the same purpose, and should be kept in constant motion with a spoon, or any thing that will answer, until there are unmistakable signs of its setting, and then it should be emptied into the cup and conveyed to the mouth as quickly as possible. As we said before, the plaster used for this purpose should be of the very best quality and freshly calcined, for it will not do to add salt to it to quicken its hardening, as is customary in the use of plaster alone. In very difficult cases, where the gums have receded, thereby exposing the necks of the teeth, it is best to have more spar than plaster in the batter used, for then the giving will be more apt to take place at the very point of difficulty. In such cases we know it is out of the question to get a perfect impression with anything; but we are confident this will be found more practicable than either wax or plaster, for it being harder than one and not as hard as the other, and somewhat brittle, is thereby more liable to give where it should—at the very point of trouble. We think a little experience is all that is necessary to convince any one that there are few cases, if any, where a better impression cannot be taken with this mixture than with either plaster or wax; for about the last two years we have used nothing else. The impression, when taken, and as represented in letter

A, should next be placed in flask No. 1, as represented in the following cut. This flask is cast from gray iron, and

No. 1

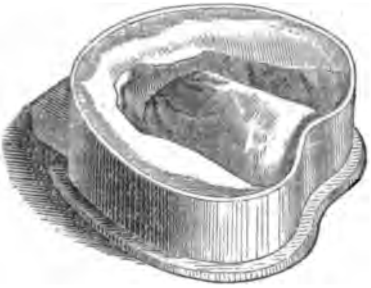


A

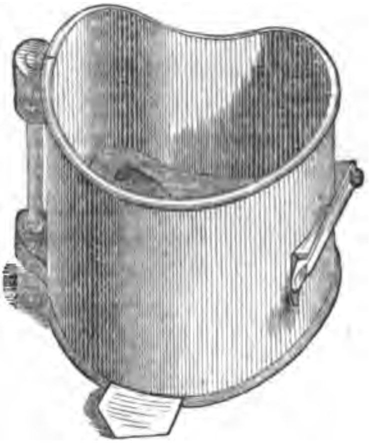


has a large open space in the bottom, leaving only a rim on the inside large enough for the impression-cup to rest on. This open space is for the escape of moisture coming from the holes in the cup, as before described. The space between the impression and the flask should now be seamed up with batter a little thicker than that used for the impression; it should be spread with a knife or spatula, so as to prevent it running down much between the cup and the rim of the flask. It is not best to use much batter for this purpose, just enough to hold the cup in place, and to give a smooth, continuous surface to the parts. When this is properly done it will present the appearance of the annexed representation, marked B. This flask and impression, thus prepared, is now ready for flask No. 2, which, when placed around the first, will present the following appearance. The whole should now be placed in an oven or on a stove, or any place where it will dry; this can be done either rapidly or gradually; when we are in a hurry we generally have it dry by the time the metal is melted, but it may be better to give it more time. It is not my wish to say anything here about metal; almost every dentist has some peculiar favorite of his own; of course it is immaterial what kind is used in this process. We generally construct our dies from zinc. Some time after the metal has been poured in the flask, a red hot iron should be placed in its center, and held there until it begins to set, then the iron should be withdrawn and more metal poured in. This is done to command the shrinkage, making it take place where it will do no harm; in other words, the metal should always be made to congeal last at the top of the flask: an iron, shaped like a tinner's soldering iron, is about the kind necessary for this purpose. When the die has become sufficiently cold, it should next be removed from the impression, etc., and flask No. 2 placed around it as before, then inverted, and the counter-cast taken.

B



No. 2



In conclusion, we would remark, that all improvements should be considered valuable in proportion as they save time, money and labor. The time and labor necessary for obtaining a die by this process, will, on fair trial, be found about one-third of that consumed by the usual method, and the material, flasks, etc., will cost but a mere trifle—ten or twelve dollars. Here, then, as we economize time, money and labor, we think we may be allowed to assert *that we have an improvement.*

## ARTICLE IX.

## *Artificial Dentures.* By Dr. John Allen.

Lower sets of artificial teeth are often more difficult of adaptation than upper ones, owing to the great amount of absorption that may have taken place on the lower jaw, leaving scarcely any ridge or foundation for them to rest upon, and in some instances the place where the ridge ought to be, there is only a deep hollow, with muscles, ducts and glands, almost closing over it on either side. These tend to buoy up the denture and keep it afloat in the mouth, which renders it useless, if the plate is so wide as to rest upon them.

In order to overcome the difficulty when such cases occur, the impression should be taken with great care to prevent the inner folds of the cheek from overlaying the alveolar ridge, or hollow. These folds can be easily raised and moved outward with the fingers when the impression is being taken. After the impression has become hard, it should be trimmed so as form a very narrow bed, from which to form the plate. When the submaxillary ducts, sublingual glands, or their connecting fibrous tissues, raise above the hard ridge when the tongue or muscles are moved, the base should be so narrow as to allow them to pass up on the inside of the plate and teeth without dislodging the denture. For such cases the plate should be very thick and narrow, with smooth round edges, and the teeth should be quite thin.

### *How long, after the Extraction of Natural Teeth, before an Artificial Denture should be Inserted.*

From one to two weeks the writer deems sufficient time, under ordinary circumstances, for the patient to go without teeth; and in many instances even a shorter period would suffice.

But as there is a difference of opinion upon this point, we will present the different theories and submit to the reader their claims to supremacy. The objections urged to an immediate insertion of a denture are: that the gums will not become smooth and symmetrical if a plate be fitted to them before the alveolar processes have fully absorbed, but will conform in a greater or less degree to the irregularities of the temporary plate, and prevent a good practical result; consequently they advise their patrons to go without teeth at least one year.

This theory we think erroneous, because the slight undulating surface of the gums which the plate may have occasioned, presents no valid objection; for a permanent plate can be fitted to them just as perfectly at the expiration of one year, as if a temporary plate had not been worn, and the wearer will have become so well accustomed to artificial teeth, that the second set can be worn and used at once without difficulty, if properly constructed.

Again, the longer the natural teeth have been out, the harder it is for a person to acquire the use of artificial substitutes, for the lower jaw is thrown forward of its natural position, the lips become compressed, the muscles of the mouth and face contracted, and the tongue habituated to certain movements in munching food, which tend to dislodge the dentures when attempting to use them, and the original expression in many instances is lost.

The advantages of an immediate insertion of artificial teeth after the removal of the old ones are,

1st. The patient will acquire the faculty of using them satisfactorily in much less time than if required to go without any teeth until the healing of the gums and absorption of the alveolar processes have fully taken place.

2d. The original expression can be much better preserved, as the denture prevents that compression of the lips, and contraction of the muscles about the mouth and face, which the absence of the teeth will cause.

Temporary sets should be as skillfully made as permanent sets. There are many operators, however, who insert cheap and rude temporary sets of teeth, who seem to attach but very little importance as to how they are constructed for they are only intended to be worn a year or two, which is deemed a sufficient apology for poor work. The price usually paid for temporary teeth will not justify the use of the best materials, nor the highest degree of skill and taste in their construction. This is another reason for cheap work.

Here is an error that ought to be corrected, for in this way the patient has but a miserable substitute for the natural teeth, and is often subjected to extreme mortification at their rude and uncomely appearance and want of utility.

Again, the dentist often loses caste by this kind of work, for a poor, cheap specimen is often looked upon by others as a fair sample of the skill of him who made it. Although the inference may be very unjust, yet it tells against him. We think reform in this respect would prove mutually advantageous to the patient and operator.

Instead of this cheap graceless work, let the first set be as good as the second, or as near it as the case will admit, and let the charges be based upon terms of equity. Then the patron will be better served and better satisfied than with a rude fixture, devoid of the essential requisites of an artificial denture; for however perfectly formed and adapted artificial teeth may be, they usually meet with stern resistance when first inserted, (especially full sets,) for the tongue, muscles, glands and ducts, all conspire to eject them from the mouth as unwelcome intruders. They seem not to have forgotten the old offenders that used to create such painful sensations in their neighborhood until they were all exterminated, since which time there has been comparative peace.

But the sterner will can subjugate all these opposing forces and establish harmony, provided the dentures are rightly formed, which is the condition of the compromise. The tongue will then acquire more cautious habits, and avoid those movements which at first would send them whirling out of the mouth, for the tongue is the first to repel invasion, it does not like to be restrained. The contiguous muscles, ducts and glands, also require freedom of action and they must not be infringed, for this is nature's law. But if their natural movements and functions are provided for, then the teeth will be permitted to remain quietly in their proper places and subserve the purposes for which they were designed.

But still, even with the most perfect set of artificial teeth there will be in many instances a stiff and restrained feeling and appearance about the mouth, when first inserted, that time only can remove, especially if the natural teeth have long been out. Patience and perseverance will, however, entirely overcome the difficulties that at first appeared so formidable to a new beginner.

(To be continued.)

## ARTICLE X.

### *Corrections.*

An amusing little piece has recently appeared, in "The Dental Register of the West," elegantly entitled "Another Screw Loose," to which we beg to direct the reader's attention. We, moreover, ask a moment's indulgence while we correct several errors into which the author of that piece has fallen in animadverting on an article on *Dental Societies*—which we had the honor to write for this Journal. Amusing as that performance certainly is in itself, we cannot avoid considering it in connection with similar efforts by the same author, and the aggregate of amusement thus available rather affects us to melancholy than to any other emotion. Our feelings corroborate one of the sayings of Pascal. He, although living before the rise of Dentistry, was yet able to excogitate the truth that "too much pleasure gives pain." Had he been born in this age, to witness the fantastic evolutions accomplished over our composition, it is impossible to conjecture the sublime heights of philosophy to which he would have arisen. The inimitable tricks of our harlequin critic, as he drags our remarks through the doubtful regions of his intellect until they are robbed of our meaning, would have given the great Frenchman ideas of amusement and pleasure to be sought for in vain at Port Royal or Paris. We, who have enjoyed these hitherto unknown advantages, are hence a most competent witness as to the truth of Pascal's saying. We have been delighted almost to suffering. We have laughed at the comedy but deplored the degradation of the player. We have examined "W's" polemical exacerbations, but to wonder at the infatuation which has led him to abandon his gold for his pen. How much good, according to his own notion of good, might he not accomplish by devoting his *whole* time to the production of that article by which he has acquired some reputation.

The criticisms of "W." suggest the idea of an Iroquois at battle, armed with an Australian boomerang. The ignorant, but vain-glorious savage, rushes on with triumphant whoops, but suddenly feels himself wounded, perhaps mortally, by his adopted instrument of death; true, however, to the habits of his race, his dying gasp is a defiant, exultant cry, in the face of an uninjured enemy. So "W.," using unfamiliar arms, is continually worsted, but Iroquois like, he shouts with the air of a conqueror at every defeat. Judging from the past, "W.," in this case, will claim the old woman's privilege of "last word"—and this we cheerfully concede; he shall enjoy his apparently much-prized practice of shooting the last arrow, for his aim is far too inaccurate and his mark too small for us to feel the least concern even though conscious of points open to attack.

Let us now proceed to refute "W's" strictures in the order in which they are made—assuring the reader before hand, that we shall not take advantage of the opportunity to reiterate any of the sentiments contained in *Dental Societies* further than the exigencies of the case may require. Our only object at this moment, is to prove the utter *incorrectness*, to use the mildest phrase, of every remark made by "W." in reference to our article.

His first stricture is summed up in the following remarkable interrogatory, which is evidently propounded in the expectation of forcing us to accept a dilemma, either horn of which would prove fatal to the cogency of the remarks under his consideration:—"Is a tree that monopolizes all the fruit of the orchard, bears all that is to be gathered, a failure?"—A child might answer the question, and yet, not be driven to the alternative that "W." intended, we trust that our readers will pardon us for answering so simple a question. The tree, though much diseased, may bear *some* badly developed, blighted fruit; the tree, diseased as it is, may bear *all* of the fruit in the orchard in which it stands—the other trees yielding actually no fruit at all. Now, is there any doubt that the imaginary orchard, including the tree, is a failure, or, that the tree, taken by itself, is a failure? Even in Cincinnati, where it is seemingly impossible for some persons to know whether a thing has or has not failed, the tree would be pronounced a *lamentable* failure. The experienced Pomologist—and we presume there are some in the West—would advise to have the *orchard* grubbed up, *the tree* included. Better use, he would say, could be made of the ground.

Our critic, our Iroquois we should have said, is now reveling in a garden of delight; another pomological inquiry succeeds the first. "But have local societies produced no fruit?" It is here implied that "fruit," *any* "fruit," has been denied to local societies. This, we have never done; but we have denied "true *scientific* fruit." And "W." has not shown us to be incorrect.

By way of controverting our remark as to the *two* creditable circumstances relating to the *national* societies, we are ingeniously informed of a host of the benefactions of a *local* society—the "Mississippi Valley Association." However influential or extensive, the "Mississippi Valley Association" carries the proof of its local character in its name; indeed it is *local* in every respect. Certainly none of the meritorious acts of that body—and we will admit them to be both important and dignified—can be urged as the result of scientific activity. Even "W." will not mention 'excavators,' 'socket rims,' 'lamps,' etc., as 'true scientific fruit.' They are useful, very useful; they indicate great ingenuity, but they cannot be offered as a vindication of *science* in dental societies.

"W." concludes this part of his subject as follows:—"And much might be said of the honorable and useful efforts of other local societies: but we must refrain. The above will show how little credit is to be given to such sweeping assertions as this writer seems fond of." It will be observed that, contrary to the practice of "W.," we give our quotations unmangled:—Here "W." in speaking well of the "honorable and useful efforts of other local societies," would imply that we have unjustly reprobated the institutions in which he, sagaciously, sees much good. So far is this from being the case, that while we denied that they had produced anything of scientific importance, which we pronounced the greatest good, we plainly approved of their establishment, when commenting upon that meeting of the convention which recommended them. Any credit, therefore, that "W." would appear to claim in view of discernment exhibited, in contra-distinction to our want of it, is wholly unwarrantable. It is well that he promises to "refrain." Instead of refraining, however, note the last clause of the sentence quoted. With the utmost effrontery we are charged with being fond of, or of *seeming* to be fond of, sweeping assertions. For once "W." is uncertain. Notwithstanding the fact "that the above will show how little credit is to be given to such sweeping assertions," he finishes the paragraph by stating that we only "*seem* to be fond of" those very things the "little credit" of which he shows by "the above." In other words, he proves that little credit is to be given for things which we practice, but he confesses that he does not know whether we have those things or not. Having incoherently attempted to convict us of using certain contradictory expressions, in the first part of his piece, the clever author of "Another Screw Loose," devises the expedient of "sweeping assertions" to strengthen his flimsy assaults. He supports his man of straw with a cobweb.

We next come to a long paragraph on the attributes of the old and the young *croaker*. Many surmises are made as to whether we are the one or the other. First, moral hints are aimed at us, we, meanwhile, sustaining the character of "old croaker." But fearing lest we should escape in that character, we are, with customary nimbleness, disposed of as "young croaker." Without divulging our incognito, however, we are glad to state that we could not strictly be assigned to either category. Nor have we ever been of the *profession*, or of the *auxiliary* branches of science, as understood by the American Dental Convention, though we have inadvertently made use of the word *our* in connection with the profession in some places. Hence we are not "disaffected" in the manner charged: nor have we taken the "back track," been "disappointed" or "confused." Moreover, we disclaim "martrydom," or the idea "that the only hope of the profession lies deep down in the recesses of our mind." We do not habitually "rebuke young men for their opinions," although this would not be amiss in some cases; nor do we tell old men "*experience.*" This last we unambiguously censured in *Dental Societies.* In short, we might affirm that we do *nothing* in the way and manner conjectured by "W." In his usually severe logical manner, he winds up his discussion on "croakers," by assuming the very point at issue, viz. that dental societies "have done more to accomplish the ends for which they were organized, than any other associations of the same period." But this is a trifle compared with the audacious trickery of the next paragraph, in which our critic attempts to show us up as affected by a "mathematical hallucination." "For example, in speaking of the number of essays read at the yearly meetings of the 'American Society,' he says: 'The gradual diminution in the number appointed and *read continued.*' Now let us examine this gradual *diminution*, which preceded the meeting he refers to. At the first meeting after the organization, according to his showing, 'not one was read.' By the next meeting they had *gradually diminished up to three,* and by the next, to 'three or *four.*'" Here "W." quotes the *last* four words of this clause: "but out of the twelve essays, the subjects of which had been publicly rehearsed at the preceding meeting and printed in large type, *not one was read.*" Now "W." must have been perfectly aware that the quotation of the *whole* clause would have prevented him from indulging in his humorous conceit of of the "mathematical hallucination." In continuation of that clause—in which it is plain that we say that none of those *appointed* were read—we state that in the place of the twelve appointed essays, *three* were offered on subjects which had *not* been named by the society.

From the foregoing it is hardly possible to avoid the alternative, that "W." is either the victim of most complicated misapprehensions, or he is the deliberate falsifyer of what he knew to be our meaning. Certainly the misapprehensions, if misapprehensions they are, bear strong marks of *design.* In either case, we have singularly enough, an apt illustration of "W's" own aphorism: "That men make themselves very ludicrous when determined to complain, having no just grounds." Our critic is not only determined to complain, but he also invents subjects of complaint—and they are of the smallest. No expression is sufficiently unimportant to escape his intellectual antennæ. Little crumbs of orthographical doubt supply fit pabulum for his diatomaceous digestion.

Next in order, we have a succinct, but complete, specimen of "W's" method of dealing with obnoxious remarks; here it is: "Of the two national societies, this writer tells us that 'their sole result has been to show that the right course is directly opposite to the one heretofore followed.' But it is plain that the two societies under consideration followed different courses—as nearly opposite as could well be conceived. To which one of these is the right course directly opposite." Now, without discussing the characteristics of the two societies, which are doubtless different in *many* respects it is only necessary to say that the *sole result* alluded to arose from the *freedom of access*, which we represented as a most pernicious influence. One of the great reforms we proposed was in opposition to this prominent element of the societies. Both societies permitted the evil; in doing so they followed the course directly opposite the right one. We are correct in thinking that the most saucy Grub street author would not have assailed us with such a miserable quibble as this.

The next point, if possible, is more strikingly absurd than any we have yet mentioned from "W's" pen. We give it in full. "But the old society having reached 'its full vigor,' we are told that it 'began rapidly to decline,' and that it 'tottered through two or three years of puerility and died.' Reached its full vigor and failed into *boyhood.*" This is but another instance of "W's" gross perversion of our language, and at the same time, a display of his own ignorance when he would appear wise. This last, however, we do not urge. We have chiefly to do with more positive sins. We never accused the society of having any (true) vigor at all; our words were that the society had reached "what we may *analogously* call its full vigor, and now began rapidly to decline." But "W." is not half satisfied with misquoting, he, over and above, gives us a new definition of a very common word. He should consult his dictionary before attempting such suicidal witticisms as the one on *puerility*. *Puerility* means *boyishness*, *childishness*, that which is trifling, not *boyhood*. An old man may totter through years of puerility. So may a society. Having thus ascertained the meaning of the word, "W." knows his condition. He has fallen, not into *boyhood*, but into peurility.

His logomachic labors over, our critic determines that we praised the second dental convention because we were present at that meeting, and at none of the others. This determination is entirely incorrect. We have never been present at any meeting of any dental society whatever. Our opinions have been formed from the printed records. Thus another inuendo as to the motives which actuated us, falls to the ground.

Finally: The *money test* receives the light of "W's" wisdom. In reference to this matter we have only to say that, while we do not for a moment suppose that he has impaired the soundness of our views, or damaged the testimony upon which they are based, we must protect ourselves from the supposition that we attempted to elaborate a *system*—as might be inferred from the tone of his remarks. On the contrary, we were careful to intimate that we only offered an outline. He appears, nevertheless, to feel some alarm when discussing the *five or ten minutes* rule which we had suggested, as one way at least of keeping idle persons silent. The fertility of his resources at length appear to be exhausted; for, far from seizing our evident meaning, he presumes to intimate that we intended this bare hint to have universal application. It is unnecessary to develop that hint here; but "W." should remember that, among intelligent men, special provision is always made for the reception of the words of the wise. We forbear, in conclusion, to say how the provision would operate on him in such an assemblage.

## ARTICLE XI.

## *The Profession in England.**

AT the close of another year, we anxiously look for the results which should accrue to our profession, now supposed to be awakened to the necessity of reform. The eyes of our brethren in America have been directed towards us since the irruption in 1856, and they have been constrained to witness much that is highly discreditable and damaging to the cause in hand. If anything, therefore, can be asserted to prove a tendency to the better, I feel assured it will not be unacceptable. It is our habit to assume somewhat upon the genius and professional respectability of our English dentists, and propound the doctrine, that better than they do not exist, or at the least, they are equal to any others, let the locality be where it may—but although this comes out strictly true in many instances, upon the broad scale such assertions will not hold. The dentists of this country, as a community, want education. Certain things we can do, and do well, but when it comes to the embodiment of research and high scientific attainments for practical use, I apprehend that I am not speaking falsely or uncharitably when I say that the large majority in our ranks are deficient. This may be doubted by some, and denied by others, and I may be reminded that my remarks are both unnecessary and gratuitous, but how can it be otherwise where there is no standard recognized, nor proof demanded of a practitioner's actual ability. My opinions are founded upon observation, as well as the remarkable readiness with which the proposal of uniting the profession into one body for educational purposes was received. When there was reason to hope that better times in this direction were dawning upon us, the thought was cheering to a degree. Unhappily, the brightness of those first rays were soon sadly marred, and in the hurly burly of last year one and all were compelled to exclaim, "chaos is come again." Out of that confusion, however, it is my pleasing duty to inform you that I believe we are emerging. Party strife has long been our distinguishing characteristic, and that strife has not subsided nor diminished. Formerly such feelings appeared to overrule the whole of our time, leaving nothing for sober reflection and improvement. Now it is evident that each side has determined to play out its part without relaxing a fraction of its individuality, but the difference between former times and the present is, that the opposition has taken a different turn, and assumed a different tone. Once it was, who should crush out the other's influence. Now each party is eager to outstrip the other by the proof of its power in doing most good. The Odontological Society has its slow but steady method of action. The College is quicker and more showy in its movements. For months and months the Society has taken every means to press its convictions of the necessity of the Royal College of Surgeons examining dentists. The council of the College have not been permitted to lose sight of that idea.

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* This communication was intended for insertion in the January No. of the Journal, but it did not reach us till after that No. was printed. We take pleasure in publishing it now.—EDS.

In the mean time the College of Dentists has been performing a series of diplomatic gyrations, only at last to fall back upon its original policy, which may be summed up in two words, independence and education.

The advantage of one course of conduct over the other is manifest, for the Society has gained its object, while the College has reaped nothing except a decided loss of members, many of whom have not been content to remain neutral, but have joined the opposing Society.

So long as a foundation for better things is laid, we might be content to place the "feeling" on either side in a subordinate position, or overlook it altogether, were it not that unity of action would secure the former, and at the same time do away with the unsightly spectacle of a useful and honorable profession fiercely divided against itself. As an independent viewer of the rivalry going on, I cannot over estimate the important fact that we now have a dental hospital, two dental schools, and an examining board at the Royal College of Surgeons—composed of surgeons and dentists—who will test and reward the proficient candidate for the new degree. If antagonism can thus be turned to good account, what should we not be permitted to anticipate from united friendly action.

It is perfectly true that the hospital and both the schools were originated with a large amount of opposition as the incentive. Your excellent convention is a severe reproof to our disjointed condition, but I fear it will be a long time ere the dentists of the United Kingdom will meet thus for mutual and general good, the profession here being more decidedly "split" than ever. Once we were apart because we did not know each other. Now we are asunder because we do know and cannot appreciate each other. This same understanding has taken some time to work out, and some ugly circumstances have turned up in the process. Unfortunately, in England we labor under the distinction of "class." Those who have obtained a high position in their profession look for and demand a certain amount of respect, and as a rule that is best displayed by a deferential distance being rigidly maintained. They will not be dragged into contact with their inferiors, and he who makes the attempt is sure to meet with a repulse; nevertheless, "*Ogni medaglio ha il suo reverso.*"

The College of Dentists still maintain their intention of applying to government for a charter, but I anticipate there will be a difficulty in obtaining it, now a door has been opened specially for the purpose they desire, in another direction. The Metropolitan School is in full swing, and is likely to be well supported. They have received a very strong stimulant to exertion in Mr. Robin-son's munificient gift of twenty guineas to be awarded as a prize every second year, for the best thesis on a given subject relating to dental science. This prize has been made over to the school in *perpetuity,* and is much spoken of.

The London School of Dental Surgery is also progressing very favorably, several pupils having entered. The session commences so as to harmonize with the summer sessions of the various medical schools in the metropolis. The hospital, I can inform you on good authority, is prospering, and although I cannot anticipate the report of that institution—which will not be issued until the middle of January next—I do not hesitate to say that nearly two thousand patients will have been treated by the close of this month, and it is possible a still larger number will be recorded.

Up to this date the curiculum of the Royal College of Surgeons has not been issued, so that aspirants for the licentiateship in dental surgery—as I apprehend it will be termed—do not yet know what and how much will be required of them. This, however, is certain, that all who possess a fair amount of practical knowledge will have no very great difficulty in possessing the diploma.

I trust the new year may inaugurate a still better feeling for advancement in our professional attainments, and that before long I shall have the happiness to inform you that we have forgiven and forgotten one another's feelings and that peace and good will have secured a permanent triumph over those lower passions, of the manifestation of which he is the better man who is most ashamed.

P. S. Neither of our journals for this month have as yet made their appearance.

London, *December* 15*th*, 1859.

# SELECTED ARTICLES.

## ARTICLE XII.

*On Tic Douloureux:* "The painful affection of the face, *Dolor Faciei Crucians,*" of Fothergill, with a new operation for its cure. By J. M. CARNOCHAN, Surgeon in Chief to the State Hospital, &c. Read before the Medico-Chirurgical College, January 12th, 1860.

SOME months ago I published a paper on *Tic Douloureux,* or neuralgia of the face, and at the same time proposed an operation for the cure of the disease, which in my opinion is founded upon the physiological laws which govern the functional manifestations of that part of the nervous system presiding over general sensation, as well as upon certain pathological appearances, which I had found to be present in portions of nervous trunks after their exsection from the face. I propose this evening to bring before the "College" the views I have heretofore stated in relation to the pathology, seat and treatment of neuralgia of the face, and to describe my latest operation for exsection of the trunk of the second branch of the fifth pair of nerves, as far as the foramen rotundum of the sphenoid bone—an operation which I believe to be an improvement on the one I at first proposed for the exsection of that nerve. Before I proceed, permit me to congratulate myself upon the presence of so large a number of gentlemen, whose knowledge of physiology will insure a close analysis of the remarks which I shall have the honor to make.

Let us for a moment glance at the amount of precise information which science had afforded on this subject up to the time I published my paper some few months ago.

It is only within a comparatively recent period that neuralgia of the face has attracted the serious attention of medical authors; or, perhaps, it may be more properly stated that the disease has been surrounded by such obscurity and perplexity, as to have baffled description. André, a French surgeon, in 1756, published his researches upon this malady, and gave to it the name of tic douloureux. According to this writer, the affection is characterized, "*par une douleur plus ou moins vive, et par des grimaces hideuses qui mettent un obstacle invincible à la réception des aliments, qui, éloignent le sommeil, interceptent et lient souvent l'usage de la parole: agitations qui, quoique vagues et périodique en elles-même, sont néanmoins si fréquentes, quelles se font sentir plusieurs fois dans un jour, dans un heure, et quelque fois sont sans relâche et se renouvellent à chaque minute.*" This description, as far as it goes, refers to the disease when it has acquired a high degree of intensity, and coincides with the malady which Fothergill soon after (in 1782) described under the name of "Painful Affection of the Face." The account given by Fothergill is more complete and exact than that of the French surgeon just named, as we may learn from the following extract:

"From imperceptible beginnings, a pain attacks some part or other of the face, or the side of the head; sometimes about the orbit of the eye, sometimes the *ossa malarum*, sometimes the temporal bones are the parts complained of. The pain comes suddenly, and is excruciating; it lasts but a short time, perhaps a quarter or half a minute, and then goes off; it returns at irregular intervals, sometimes in half an hour, and sometimes there are two or three repetitions in a few minutes.

"The kind of pain is described differently by different persons, as may be reasonably expected; but one sees enough to excite one's compassion, if present during the paroxysm.

"It returns full as often in the day as in the night. Eating will bring it on some persons. Talking, or the least motion of the muscles of the face affects others; the gentlest touch of a hand or handkerchief will sometimes bring on the pain, whilst a strong pressure on the part has no effect."

About the same time that Fothergill's memoir appeared, Thouret, another French writer, published an article on this subject, in the *Mémoires de la Société Royale de Médicine.* This writer states that the disease appears to fix itself particularly in certain localities of predilection: "*comme la mâchoire inférieure, le trou mentonnier, le voisinage de l'apophyse mastoïde et la région de la joue la plus voisine de l'œil. En général,*" he adds, "*le siège le plus ordinaire du mal est sur le côté du nez immediatement au-dessous de l'os de la pommette, à l'endroit ou une branche principale du nerf maxillaire supérieur sort du canal sous-orbitaire.*"

The authors heretofore alluded to, contributed, by their observations, chiefly to the symptomatology of this disease.

Chaussier, guided by his anatomical knowledge, made some steps of advancement in determining the seat of neuralgia of the face. In his "*Table Synoptique de la Néuralgie,*" (Paris, an XI,) he makes four principal divisions of neuralgia of the face, according as the disease seems to be concentrated upon one or other of the branches of the fifth pair of nerves, or upon the facial nerve proper, itself. Thus he describes separately *frontal neuralgia, infra-orbital neuralgia, maxillarg neuralgia;* and in a note he admits the existence of neuralgia of the *facial nerve.* The course of the tri-facial nerve and its anastomoses, have evidently formed a basis of this classification.

Since the publication of Chaussier, several dissertations and theses have appeared at different times, in which new cases are related, but without the addition of any novel information on the subject.

In 1834, M. F. Bellingeri, of Turin, published a memoir upon neuralgia of the face; the chief features of which are his advocacy of an intermittent form of neuralgia, and the theoretical division of neuralgia into three species—the *inflammatory*, the *irritative*, and the *nervous*; the first species being again subdivided into the *sanguine*, the *phlogistic*, and the *rheumatismal*.

In more recent times, (1835–36,) the question has been agitated by M. Bérard, as to the existence of a neuralgia of the *facial nerve* proper. This physiologist has arrived at the conclusion that the nerves of the *fifth pair* alone, in the face, can be attacked with this malady. Upon the other hand, in a later publication, M. Jobart de Lamballe supports an entirely different opinion, and maintains that all the nerves of the face are liable to be attacked by neuralgia. In regard to this last point of discussion, we are aided in arriving at a correct conclusion by anatomical facts, as well as by the morbid phenomena which are frequently exhibited in neuralgia of the face. The *portio-dura*, or facial nerve, is undoubtedly a nerve purely of motion, at its origin; but, before it emanates from the stylo-mastoid foramen, it has been joined by a sensitive branch from the ganglion of Meckel. Physiologically, after this junction, the facial nerve must be a mixed nerve, and must be sentient to impressions, both normal and abnormal. In fact, I consider that the facial nerve is not only the seat of neuralgia at times, but that it is frequently the conductor of neuralgic phenomena, and morbid sensibility, to the nervous periphery of the face, when the true seat of the disease is located on the trunk of the second branch of the fifth pair. I make this statement, partly from observation, and partly from the consideration of the law which regulates the propagation of nervous sensibility, viz. that the sensation is referred to the periphery of a nerve, or to its extreme branches, when the trunk is the seat of irritation or disease. A simple illustration of this is found in the effects which follow a blow impinging upon the ulnar nerve at the elbow. It is well known that the impression imparted to the trunk is conducted to the ultimate distribution of the nerve, and that the sensation is referred to the little finger, and to the ulnar border of the ring finger.

By reference to the history of this disease, we find that notwithstanding its formidable character, and the numerous attempts made to unravel its pathology, science has not been as much enriched as might be supposed, with facts observed with care and precision. With the exception of the discoveries of Charles Bell, and others, in relation to the functions of the nerves, which are implicated in neuralgia of the face, and some vague and unsatisfactory therapeutic experiments, we have made but little advancement in regard to the nature and management of this disease, since the time of Fothergill.

As yet authors differ concerning the anatomical lesions which should be considered as characteristic of neuralgia of the face. Some deny that any are to be found in those cases where the signs of the disease have been indicated in an incontestable manner; and one of the latest writers expresses himself in the following indefinite language: "*La neuralgie tri-faciale doit être considérée comme une lesion de fonction donc nous ignorons entièrement la cause organique.*"

Again, the seat of the disease has been referred to distant irritations, especially in the splanchnic cavities—to a foreign body acting upon the nerve—to the pressure of bone upon some portion of the nervous trunks. By some authorities, it is referred to increased vascularity and thickening of the nerves; while Astley Cooper, on the contrary, states, that the nerves present their natural color, and are rather diminished in size than enlarged.

The medical treatment, although embracing a vast number of therapeutic agents, is most frequently unavailing; and it is well known that the surgical treatment, consisting principally of topical applications, and the division on the face of the branches of the fifth pair, at their exit from their respective foramina, is, for the most part, utterly useless in affording relief, or at best affords but very temporary benefit. The medical inquirer, then, has no reason to be satisfied with the observations heretofore made, but, on the contrary, is justified and urged in bringing under scientific scrutiny such new facts as may assist in unveiling still further the mysteries which envelop this most painful malady.

In Part Two of my "Contributions to Operative Surgery and Surgical Pathology," I have described a case of Neuralgia of the Face, certainly the most remarkable on record for its severity and protracted course, and for the number of operations which were performed on the patient. The facts which were developed during the different stages of the treatment led me to project an operation for the cure of aggravated *Tic Douloureux.* It had for its object the exsection of the trunk of the second branch of the fifth pair, beyond the ganglion of Meckel; at the same time removing that ganglion, or insulating it with its branches from the encephalon. Experience, however, has since convinced me that it is not adequate to effect the removal of the whole trunk, as far as the base of the skull, with the same certainty and safety from hemorrhage as that which I now adopt.

The following is the history of the case, and here standing before you is the patient himself, finally cured by an operation, which will hereafter be described. [The patient was presented and examined by the members present.]

*Case.*—J. C. Forbes, aged 47, a citizen of Hoboken, New Jersey, married, of nervo-bilious temperament, by occupation a master carpenter, applied to me for advice in the month of August, 1855. He had, with the exception of his neuralgic affection, always enjoyed good health, and had no special taint of the system.

He stated that he observed the first signs of this disease in May, 1849. At that time, while passing a handkerchief across the upper lip and end of the nose, he perceived a sharp, poignant, lancinating pain, shooting from near the middle of the upper lip, on the left side, along the furrow at the junction of the nose and cheek, up to the inner angle of the eye of the same side, and passing deeper through the bone of the cheek, in the direction of the spheno-maxillary fissure. The same pain was started when the upper lip was touched with the tip of the tongue, or when making an effort to swallow. These symptoms, assuming a paroxysmal character with irregular intermissions, continued unabated until the autumn of the same year, when they entirely disappeared.

In the spring of 1850, the attack was renewed, commencing as it had done the previous year, and gradually becoming more painful. It was supposed by some that the trouble might originate from disease of the teeth; and, by the advice of a dentist, all the teeth were extracted, except a small stump on the right side of the lower jaw. This proceeding gave no relief; the disease increased in severity; the paroxysms of pain became more frequent, and almost intolerable, extending over the entire left cheek.

From that time (June, 1850) until February, 1852, the patient continued under medical treatment; he gave up his business, and sedulously tried the most approved prescriptions; but in vain.

Finding no relief from the use of internal remedies as advised by skillful physicians, he consulted a hospital surgeon of eminence, in this city, with the view of having an operation performed, if deemed expedient. An operation was advised and performed (February, 1852) by dissecting, from the interior of the mouth, without external incision, the entire cheek from the superior maxillary bone; the separation of the tissues extending across from the nose to the prominence of the malar bone, and vertically, from the alveolar border, as high as the margin of the left orbit. A considerable quantity of blood flowed while the incisions were being made. Much relief followed this operation, and the paroxysms seemed to be kept at bay for a period of about seven months.

The following November, the disease returned with its wonted severity, and the patient was again put under medical treatment, using chiefly large doses of quinine. In the latter part of December, 1852, the paroxysms became so aggravated and intolerable, that the patient again entreated the same surgeon to perform another operation. This was accordingly done by making a V incision below the margin of the orbit, and dissecting the flap upward, so as to expose the infra-orbital foramen. The nerve was then divided at its exit upon the cheek. The patient was again relieved, until the autumn of 1853, when the pain returned, with severer manifestations than before. The patient was again put under medical treatment, galvanism being added, without any advantage, to the long list of therapeutic means previously resorted to.

In January, 1854, a professor of surgery, of some eminence in this city, was consulted, and performed the same operation as that last described; but besides the incisions for dividing the nerve, he cauterized with a red-hot iron the divided surface of the nerve, at the infra-orbital foramen. Relief was again obtained until August of the same year. During that month the paroxysms reappeared with their previous intensity, and another operation of a similar character was performed in September, by another surgeon, also of this city; but without any good result.

In October of the same year, (1854,) harrassed, despondent, and worn out with the accumulated violence of his sufferings, the patient consulted my celebrated friend, Professor Mott. With the hope of affording relief, the tissues of the cheek were freely divided by subcutaneous incision, once in October, and again in November, by that distinguished surgeon. Very slight amelioration of the pain was effected by these operations, and on the 8th of January, 1855, Professor Mott performed his third operation, by making a V incision on the cheek, in the same manner as had been previously done, and dividing again the nerve at the infra-orbital foramen.

These numerous operations, although lulling the terrible sufferings for a time, left no lasting impression on the disease. For nearly five months a partial mitigation of the symptoms followed Dr. Mott's last operation, but in June, 1855, the pain set in afresh with its accustomed violence; and the patient, unable to attend to business, his means exhausted, his strong frame shattered with prolonged and intense agony, and his mind paralyzed with despair, took refuge in the New York City Hospital. There he remained in the medical department, under the care of the physicians of that institution, until the month of August, 1855, when he took his discharge; having received no benefit from the treatment prescribed.

It was at this stage of the malady that the patient came under my notice. A few days after he left the hospital, he was brought by some of his friends to consult me, in a condition bordering on delirium: wild, and almost mad, as he himself stated, with the intensity of his sufferings. He most piteously besought me to perform some operation for him, different from those previously tried; protesting that he was utterly regardless of any danger that might be incurred, or of the extent or character of the mutilation which might result.

After hearing a recital of the various operations to which he had been subjected, and seeing, from his condition, that nothing really useful had been accomplished, it seemed to me futile and hopeless to recommend an operation which could consist of the division simply of the nerve. As the catalogue of medicines of most repute in neuralgia had been exhausted unavailingly, it was useless to repeat them, and ordering, for the moment, a strong dose of muriate of morphine internally, and an ointment composed of the extracts of belladonna, hyoscyamus, and stramonium, with a small portion of veratria, I undertook to perform on him, on the following day, the operation of exsecting a piece of the trunk of the infra-orbital nerve.

The condition of the patient, after his return home from the hospital until he came to me for advice, was truly appalling, and enlisted the sympathies even of strangers. He could neither rest, sleep, eat, drink, nor talk, without the occurrence of paroxysms of the most violent character. He would start from his couch with the wildness of a lunatic, and would throw himself on the floor, screaming and howling from the intensity of his agony. At times, his sufferings would overcome his moral courage, great as that was, and he would threaten self-destruction. The slightest impressions on the external surface of the face, especially on the upper lip or cheek, or upon the mucous lining of the mouth, pharynx, or nose, would bring on, most commonly, paroxysms of the most aggravated description. The intermissions between the paroxysms, during the exacerbations or attacks of the disease, were variable; sometimes lasting half an hour or more, sometimes a few minutes, and at others only some seconds.

On the 31st of August, 1855, I performed the following operation on Forbes: He was seated on a chair in a good light, and the assistants being properly arranged, he was put under the full influence of chloroform. A V-shaped incision was made, the base towards the margin of the orbit, and embracing the infra-orbital foramen. The flap thus formed was dissected upward to the margin of the orbit, and the dissection was extended still further, so as to expose half an inch of the osseous floor of the orbit. There was some difficulty in finding the foramen, and in insulating the nerve, owing to the matting of the tissues, as well as to the extensive and hard cicatrices, resulting from the previous operations, performed at the same point. The nerve, at its exit from the foramen, being found with the hammer and chisel, a portion of bone was detached from the margin of the orbit, so as to remove the upper semi-circumference of the foramen infra-orbitale. Another piece of bone was now easily removed from the anterior part of the infra-orbital canal, and a portion of the trunk of the nerve was thus exposed. The nerve was easily detached from the canal at this part, and about a quarter of an inch of its trunk was exsected rapidly with the scissors.

Although chloroform was very freely administered, it was found almost impossible to keep up the anæsthetic influence sufficiently to annul the pain. While apparently insensible, when the nerve was touched with the instruments he would start violently, uttering a fearful shriek, and would become almost immediately perfectly conscious.

This operation by excision effected a greater degree of immunity from the severe symptoms than had been afforded by the mere division or incision of the nerve. Up to this period, from the time of the first attack, the patient had not been able to eat or drink without starting the severe pain in the face; the neuralgic paroxysms now, however, were not incited by the act of swallowing. In fact, the relief was immediate, and the disease seemed to be cured.

This relief from suffering was not of long duration. In February, 1856, the paroxysms were again renewed with as much intensity as ever, and the patient again demanded another operation. His condition was one of desperation, and justified a resort to any means which held out the slightest probability of success. I proposed to him, explaining the nature of the operation, to lay open his face, trepan the antrum maxillare, separate the trunk of the second branch of the fifth pair from its connections, as far as the posterior part of the antrum, and then to exsect a still larger portion of the nervous trunk. An eager and ready assent was given to this suggestion, and on the 21st of February, 1856, I accomplished the operation in the following manner: An incision was made, commencing opposite the lower border of the left orbit, below the inner angle of the eye, and carried downward and outward, so as to terminate at a point about half an inch below the infra-orbital foramen; another incision, beginning at the lower border of the orbit, and below the outer angle of the eye, was made so as to join the lower extremity of the first. At the junction of these two incisions, a sharp pointed straight bistoury was now thrust through the cheek, and the upper lip divided entirely, midway between the median line and the labial commissure. The V-shaped flap first made, was dissected upward, and the other flaps were thrown inward, towards the nose, and externally over the malar bone. The fore part of the antrum maxillare and lower margin of the orbit were thus freely exposed. The situation of the foramen infra-orbital was easily ascertained, and the crown of a trephine, three-quarters of an inch in diameter, was applied upon the anterior wall of the antrum; the trephine grazing the lower border of the foramen. A portion of bone was thus removed, so as to expose the cavity of the antrum. The membrane lining this cavity was found to be thick and velvety, and to present a dark maroon color. The anterior portion of the trunk of the nerve was sought for and found. With a hammer and delicate chisel, the infra-orbital canal was laid open, and the nerve detached from its bony wall, as far backward as the posterior wall of the antrum. The operation was finished by exsecting, by a rapid movement of the scissors, to the extent of about an inch, the nervous trunk thus laid bare and exposed. A pledget of dry lint was placed in the antrum, and the various incisions brought together by means of the Carlsbad pins as sutures.

Notwithstanding the complete anæsthesia under which the patient was kept, he would frequently, when the trunk of the nerve was touched with the forceps or chisel, jump from the chair as if struck by a powerful shock of electricity.

After this operation the unfavorable symptoms again disappeared, and the patient flattered himself that a cure had been effected. The paroxysms, with the exception of an occasional *tic*, abated, and he had such confidence in his recovery, that he accepted an offer to visit Panama, New Granada, to engage again in business.

On the 20th of September, 1856, he left the United States, and arrived at the Isthmus of Panama during the following month. Six months were passed there without any annoyance from the disease. In the month of March, 1857, after exposure to cold, and sleeping in a damp atmosphere, the pain again appeared with much severity. It now seemed to commence from a point in the upper maxilla, opposite the alveolar border, where the first incisor tooth had been extracted, and to dart backward with great acuteness towards the spheno-maxillary fossa. The paroxysms of pain were as severe, although not so diffused, as those by which the disease was ushered in.

Forbes was again forced to relinquish his business, and sailed for New York city, where he arrived in the latter part of April, 1857. He paid me a visit, and related to me the story of his recent attack, with an air and expression of utter despondency. In fact, he was again laboring under all the symptoms of tic douloureux.

On the 20th of April, at his earnest request, I performed another operation on him. This consisted in dissecting back the tissues of the cheek, and exposing the antrum maxillare. By the use of Lüer's bone-cutters, I cut away the outer and lateral wall of the antrum, as low down as the alveolar margin of the bone, so as to destroy the loop of nerves which results from the anastomoses between the branches of the posterior and anterior dental nerves. This operation (the tenth) was of very little avail.

During the following three months he resorted to the free use of narcotics, for the purpose of annulling the pain. In September, 1857, Forbes again entreated me to do something for his relief, and I dissected the cheek from the bone, by dividing the cicatrices which had been recently formed. This afforded temporary relief, resulting probably from the local depletion.

The cheek and left upper lip were now insensible to the touch, and the spasms were aroused by eating or swallowing; or they occurred spontaneously. The pain was referred, chiefly to the upper maxillary bone, commencing at the point where the two left incisors had been extracted, and darting backward in different directions, towards the base of the skull. A few days only of partial relief followed, when the pains were renewed with such severity that Forbes again besought another attempt to procure some amelioration of his suffering.

From the failure of the operation by which about an inch of the trunk of the second branch of the fifth pair of nerves had been removed, it occurred to me that the portion of the trunk which was left must be still in a diseased condition, and that the train of neuralgic phenomena which were manifested, was to be referred to the peripheric ramifications, emanating from the ganglion of Meckel, and also to those branches which emanated from the small portion of the trunk of the nerve still remaining in front of the *foramen rotundum.*

As Forbes' case at this time presented itself, I was unwilling to cut down again through the cheek and seek for the remaining stump of the nerve, in order to exsect this as well as the ganglion of Meckel. With a faint hope of mitigating the disease, on the 2d of October, 1857, I again laid bare the antrum and the bones of the cheek, by making, through the soft parts of the cheek and through the lip, the same incisions which had been made in my second operation for exsection of a portion of the trunk. With Lüer's bone forceps I then cut away the remaining portion of the anterior and lateral portions of the antrum, with a part of the posterior wall of this cavity; removing a part of the alveolar border of the upper maxilla, so as to encroach partially upon the vault of the mouth; while toward the nose, the portion of bone opposite the two left incisors was removed, as well as a considerable portion of the ascending process of the superior maxilla. By this operation it was intended to destroy still further the several nervous branches running through the texture of the bones of the face, on the affected side. A dossil of lint was laid in the cavity of the wound, and the lips of the incisions brought together by the twisted suture. The wound healed, but a free communication remained from the mouth with the antrum, between the cheek and the edge of the vault of the mouth.

As before, a cessation of the symptoms followed the operation. But the paroxysms returned in a few weeks, with tempered severity, however, and at longer intervals. When the pain did not start as if spontaneously, impressions made upon the nasal, buccal, or pharyngeal mucous membrane appeared to be the exciting or immediate source of the paroxysms. It is upon those surfaces that the peripheric extremities of the branches, which take their origin from the ganglion of Meckel, are distributed. In order, therefore, to change the sensibility of the mucous surface, I began to cauterize freely, upon alternate days, the mouth and pharynx, as well as the antrum and cavity of the nostril, with a strong solution of nitrate of silver, by injecting the solution into the antrum from the mouth, through the communicating passage now existing. By these means and the occasional use of narcotics, the patient obtained very great relief.

In addition to the action of the nitrate of silver upon the mucous surfaces just mentioned, on the 3d of January, 1858, a seton was introduced into the back of the neck, on the left of the mesial line, for the purpose of maintaining a continued revulsive influence in proximity to the fifth pair of nerves. From this time, also, ten grains of quinine were daily administered internally. During the twelve months following the last operation, (October, 1857,) Forbes had comparative immunity from his disease; occasionally, however, he would be attacked with sharp paroxysms of pain suddenly passing through the left side of the face. He had also returned partially to his business, and ate, drank, and slept with tolerable comfort.

This respite from suffering was interrupted on the 15th October, 1858, when he had, after exposure to cold, some severe and sharp paroxysms. These were excited principally by the act of swallowing either fluid or solid articles of food. After continuing for two days, the paroxysm ceased under the influence of a cataplasm of stramonium leaves, and the tincture of aconite administered internally. At the date of November 4th, 1858, he was so well that he was about to resume his business, and on the preceding Tuesday he went to the polls to deposit his vote as an elector.

Notwithstanding his ameliorated condition, it could not be said that the patient was cured. It was not improbable that he would be liable at times to be attacked with paroxysms of his disease.

As was partly expected, Forbes was again attacked with the disease, and with such severity that, in June, 1859, he called upon me and insisted upon being subjected to another operation. By this time, from repeated operations, I had come to the conclusion that the only effectual treatment was the exsection of the portion of the trunk still remaining in front of the foramen rotundum, in immediate connection with the ganglion of Meckel; thus insulating that ganglion and its branches from the encephalon. In accordance with this view, the remaining stump of the trunk was exsected, close to the foramen rotundum. The result was satisfactory, and continues to be so.

I shall now proceed to offer some general considerations. *Tic douloureux* of the face proper, or of the second branch of the fifth pair of nerves, is by far the most common form of facial neuralgia. This may be explained by the more numerous branches which are given off by this trunk, and by the position which these branches occupy—in some places, pent up in osseous canals, and in others, subjected to exposure, to changes in temperature, as well as to the agency of morbific influences, from which the other two trunks of the fifth pair are exempt.

I believe that the phenomena of this neuralgia can be explained with as much precision as in any other disease which is well understood. In cases of the most aggravated form, whatever may have been the original exciting cause, I have no doubt that the real seat of the disease is in the trunk of the nerve, in front of the *Gasserion ganglion*—in some part of it, or in the whole of it. The causes of the disturbed and changed condition of the trunks of the nerve may be numerous—prolonged irritation upon the periphery—exposure—injuries—tumors—diseases of the teeth—pressure resulting from periosteal or osteal thickening of the osseous foramina or canals—sudden suppression of any of the important secretions, as of the catamenial discharge. From one or more of these causes the trunk itself may be primarily affected, or, acting upon its ramifications, the irritation may be propagated to it. Prolonged irritation induces inflammation, and this generally remains passive or chronic. Some of the terminations of inflammation—such as the effusion of lymph among the interstices of the neurilemma or the nervous tissue itself—may become developed; leading to a vascular, engorged, thickened, and enlarged condition of the nerve, or to a softening of it, at one or more points. In fact, vascular engorgement, or inflammation, with some of its consequences, of the neurilemma alone, or of it and the nerve together, by whatever cause produced, is the condition which constitutes the pathological changes in the trunk.

In all cases where I have performed exsection, the nerve was found to be red, vascular, engorged and considerably enlarged.

The diffused character of the pain can be easily understood, if we take into consideration the numerous ramifications of the second branch of the fifth pair, and the extensive surface over which their ultimate filaments are distributed. The periphery of the nerve occupies not only the superficial parts of the face, but extends deep amongst the bones of the upper jaw, to the nasal fossæ, to the septum nasi, to the hard and soft palate, to the pharynx, to the inner ear, to the orbit, and to the temporal and malar regions.

It is well established, that if the trunk of a nerve be irritated along its course, the painful sensation will be referred to its periphery. If the ulnar nerve, for example, be struck where it passes behind the internal condyle, a sensation of pain is excited, which is referred to the little finger, and to the ulnar border of the ring finger; and if a prolonged irritation be kept up at this point, the skin of these fingers becomes tender to the touch, the sensibility being very much increased. The pain which is felt at the knee, in *morbus coxarious*, also illustrates this law. "The obturator nerve," Sir Charles Bell remarks, "passes through the thyroid foramin, down to the hip-joint, and, after supplying the muscles, is distributed upon the inner part of the knee. The nerve in its course is thus involved in the inflammation which affects the hip-joint, and the pain is referred to its extreme cutaneous branches, at a part distant from the seat of the disease.

It is by this principle—which governs the action of the stimuli upon the nerves of sensation—in connection with the anatomical distribution of the nervous ramifications, that numerons phenomena of neuralgia can be explained. The disease being seated in the trunk of the nerve, we can readily understand that the pain must be referred to the peripheric extremities of the nerves, and will there be felt as long as the branches are in communication with the encephalon.

From these views we can see how futile the operation of division of the nerve at the *foramen infra-orbitale* must be. Where the trunk of the nerve is extensively diseased, no operation can rationally lead to a successful result, unless all the branches emanating from the trunk are cut off from communication with the brain.

I believe that in all aggravated cases of neuralgia, of the second branch of the fifth pair, the key of the operation is *the removal of the gangliou of Meckel, or its insulation from the encephalon.*

We can account for the return of the neuralgic pain, after exsection of a large part of the nervous trunk, by the induction, that some portion of the remaining nerve becomes again attacked by disease. It is well known that although the periphery of a nerve may be removed, yet, when the stump of a nerve is the seat of irritation, the person feels the pain at the locality of the former periphery. In this manner I account for the frequent return in Forbes' case of the neuralgic pain. The ganglion of Meckel, also, if left unremoved or not insulated, continues to provide, to a great extent, nervous ramifications, which will still maintain and keep up the diversified neuralgic pains. Besides, the ganglion of Meckel, being composed of *gray matter, must play an important part as a generator of nervous power*, of which, like a galvanic battery, it affords a continual supply; while the branches of the ganglion, under the influence of the diseased trunk, serve as conductors of the accumulated morbid nervous sensibility.

The bones of the cranium are liable to expansion, or thickening of their texture, from inflammatory action, most commonly dependent upon some constitutional taint. If the *os sphenoides* happened to be the seat of such disease, one or more of the foramina for the transmission of the nervous trunks might become very much contracted. A question might arise as to the effect of compression, from this cause, on the trunk of the second branch of the fifth pair, at the point where it is surrounded by the osseous sides of the *foramen rotundum*. From what has heretofore been stated, in relation to the law which governs the transmission of morbid sensibility along the trunk and branches of a nerve, subjected to an irritating cause, we should infer the supervention of neuralgia of the face, of the most severe character. In such a case, the operation of exsection of the trunk of the nerve, beyond the ganglion of Meckel, offers the best hope for relief; for, besides the removal of the trunk of the nerve, thus far, direct local depletion is obtained at the seat of the irritation; and, moreover, the portion of the nerve, placed in the foramen, will, most probably, become atrophied or diminished.

Pathological records corroborate the opinion which locates the seat of facial neuralgia on the nervous branches or trunks, after they have emerged from the ganglion of Gasser.

After the section of the fifth pair of nerves, within the cranium, it is a well established fact that the *general sensibility* is annulled in the superficial and deep parts of the face; and that the functions of the organs of *special sense* are disturbed. From this physiological fact, we arrive at the important diagnostic conclusion, that disease, involving the *trunk* of the fifth pair, and the ganglion of Gasser, so as to compromise its connections with the grand sympathetic, must be attended with pathological manifestations in the external organs of sense; the most remarkable of which are observed in the globe of the eye.

Cases illustrating this statement—important also in regard to the prognosis—are related by Herbert Mayo, Abercrombie, and others. The following case, published by M. Serres, (*Anatom. Comp. du Cerveau, etc.*,) is to the point: "A droite, l'insensibilité de la conjonctive était telle qu'on pouvait passer entre les paupières et le globe de l'œil les barbes d'une plume sans que le malade s'en aperçût; il-y-avait immobilité complète du globe de l'œil et de ses dépendances; la narine droite était également insensible à l'introduction d'un corps étranger; toutefois l'odorat n'avait pas complètement disparu. Le malade ne recevait aucune impression de l'application du sulfate de quinine sur la moitié droite de sa langue. Les gençives du même côté étaient molles, fonguesses, noirâtres, détachées des os. Il-y-avait eu successivement inflammation de l'œil droit, coarctation de la pupille, opacité de la cornée et enfin perte de la vue. L'ouïe était diminuée à droite quelques jours avant la mort. *A l'ouveteure du cadavre, on trouva la cinquième paire ramolle à son origine; jaunâtre et presque gélatiniforme. Cette altération s'enfonçait à une ligne ou deux dans la protubérance annullaire. Le ganglion de Gasser, de ce côté était d'une ligne et demie plus large que du côté sain; il était jaunâtre. Quant à la petite racine du trijeaumeau, elle était intacte.*"

I shall now describe the operation I have recently adopted for the purpose of exsecting the trunk of the nerve beyond the ganglion of Meckel, as far as the foramen rotundum; first recalling, that my first operation consisted in opening the *antrum Highmoranium* in front, with the crown of a trephine, and dissecting the nerve from before backward, towards the spheno-maxillary fossa.

*Operation.*—The trunk of the second branch of the fifth pair extends from the anterior part of the Gasserian ganglion to the place of its emergence, at the foramen infra-orbitale. It does not follow a direct line from before backward, in its course, but forms a curve, the concavity of which looks towards the mesial line. It may be divided into four parts, viz. 1st. That between the ganglion of Gasser and the posterior orifice of the foramen rotundum; 2d. That embraced by the circumference of the foramen; 3d. That which passes through the spheno-maxillary fossa; and 4th. That which courses along the infra-orbital canal to emerge from the infra-orbital foramen.

The patient is laid upon the operating table, and complete anæsthesia effected by the administration of chloroform. The head, placed upon the sound side, and resting upon a solid cushion, with the face turned towards the operator, is supported firmly in this position, by an assistant detailed for this purpose. The other assistants are properly arranged, and the instruments, consisting of a small trephine, bistouries of various shapes, artery forceps, tenacula, bone forceps, the bone forceps of Lüer, several small chisels and a mallet, and other resecting instruments, are placed so as to be of easy access to the hand.

An incision is made, commencing opposite the spheno-maxillary fossa, upon the middle of the zygomatic arch, and extending forward and slightly downward, to a point a little below the foramen infra-orbitale. From the anterior extremity of this another incision is made downward, so as to divide entirely the tissues of the cheek and lip, midway between the median line and the commissure of the mouth. The soft tissues are now freely dissected from the malar and super-maxillary bones, and the nerve sought for as it emanates from the foramen infra-orbitale. This found, it is isolated from the other tissues, and the foramen and lower border of the orbit are completely exposed. The crown of a small trephine is then applied immediately below the infra-orbital foramen, and the antrum opened by removal of a portion of its anterior wall. This accomplished, with the chisel and Lüer's forceps, the lower part of the malar, and the outer portion of the superior malary bone connected with it, are removed as high upward as a line running horizontally forward, on a level with the lower border of the zygoma. The outer wall of the antrum is made bare of soft tissue, and with the bone forceps this wall is removed. The cavity of the antrum being now freely exposed, the nerve is detached from its upper wall from before backward, breaking down the wall of the infra-orbital canal, and carefully avoiding, at the same time, encroachment upon the soft tissues of the orbit.

It now remains to detach the portion of the nerve passing through the spheno-maxillary fossa with the ganglion of Meckel. At this stage of the dissection, the lower jaw must be held firmly and depressed by an assistant. The tissues lying upon the posterior wall of the antrum are separated from this part, and pushed backward by the finger and the handle of a scalpel. The spheno-maxillary fossa is now exposed, and the internal maxillary artery is seen sending off several branches, and is close related with the nerve. It is very necessary to avoid wounding this artery. By this time the trunk of the nerve is extensively detached, and it can be pulled downward so as to facilitate its isolation from the other tissues. The foramen rotundum must now be sought for. Its position can easily be ascertained by tracing with the finger the anterior border of the external pterygoid plate upward to its junction with the angle formed by the *body* and the *great ala* of the sphenoid bone. Proceeding inward from the upper part of this angle, for about two lines, the foramen rotundum is reached. With a blunt hook, such as is used in strabismus, the nerve is still further detached where it emerges from the foramen. Gentle traction is now used upon the trunk thus isolated, and grazing the surface of the sphenoid bone, with delicate blunt-pointed curved scissors, the nerve is severed at the base of the scull. The ganglion of Meckel can now be removed, or the branches descending to form it, not cut, can be divided.

In the early steps of the operation the bleeding is considerable, and the vessels must be at once secured. A pledget of lint is laid in the wound, and the lips of the incisions are brought together by points of the twisted suture.

In Forbes' case, the same external incisions were made as described in the operation just described. The stump of the nerve, remaining between the posterior part of the infra-orbital canal and the foramen rotundum, was sought for and found. It was then isolated from the surrounding tissues, and divided at the point of emergence from the foramen rotundum.

In conclusion, I embody my views in relation to aggravated neuralgia of the face in the following propositions:

I. That the second branch of the fifth pair, extending from the ganglion of Gasser to the foramen infra-orbitale, has two peripheries: one, formed by the terminal branches of the trunk, giving off along its course, the superficial parts of the face; the other, by the terminal branches emanating from the ganglion of Meckel.

II. That in cases of severe *tic douloureux*—the *dolor cru-*

*cians faciei* of Fothergill—the seat of the disease is in a portion of the trunk of the nerve, or in the entire trunk, between the ganglion of Gasser and the foramen infra-orbitale, including that part embraced by the foramen.

III. That the trunk of the nerve being injured or diseased, pain is felt at its periphery, as well as in the part morbidly affected.

IV. That impressions, acting upon the periphery of the nervous trunk, will be reflected upon the trunk, and give rise to paroxysms of neuralgic pain.

V. That the ganglion of Gasser, or the *common trunk* of the fifth pair, cannot be the seat of the disease, because experiments upon living animals, and pathological facts, derived from post-mortem examination, demonstrate that, when this ganglion and the trunk of the fifth pair are destroyed or injured, the eye of the corresponding side becomes destroyed from defective nutrition, and also that the other organs of *special* sense manifest symptoms of functional disturbance.

VI. That the encephalic strands of the fifth pair, on the cerebral side of *the common trunk*, cannot be the seat of the disease; as in such condition of the brain there would be symptoms denoting cerebral disturbance or disease, which never exist in tic douloureux.

VII. That division of the nerve externally to the foramen infra-orbitale, or anterior to the diseased portion of the trunk, will not effect a cure: because the point of disease being still left, the morbid sensibility is referred to the locality of the periphery, although that has been removed, or insulated.

VIII. That when only a portion of the trunk of the nerve is removed, anterior to the ganglion of Meckel, the remaining portion may become affected with the disease, and the symptoms be renewed with the same severity as before the operation.

IX. That the only operation which will cure the disease is the exsection of the trunk of the nerve on the cerebral side of the ganglion of Meckel; because, 1st, the diseased part will thus be removed; 2d, because the two peripheries of the nerve must thus be insulated from the encephalon; 3d, because the influence of the ganglion of Meckel, in supplying morbid nervous sensibility, is destroyed; 4th, because the sensibility of the two peripheries of the nerve is obliterated, and consequently external impressions cannot be reflected or transmitted.

X. That there is a possibility of the neuralgia returning for a time, even after the exsection of the trunk beyond the ganglion of Meckel, from disease attacking the small portion of the nerve still remaining in front of the ganglion of Gasser, or from pressure upon it, resulting from osteitis and contraction of the foramen rotundum; the pain being referred, as already explained, to the original seat of the periphery.

XI. That, in such a case, however, the stump of the nerve, whether diseased or compressed by the circumference of the foramen rotundum, would be placed under circumstances leading to atrophy or resolution; and that the disease, existing for a short time from such causes, would eventually subside.

XII. That the three trunks of the fifth or trifacial nerve, emanating from the ganglion of Gasser, and supplying in their aggregate the general sensibility to the face, when affected by neuralgia, are to be subjected, alike, to the same rules in regard to the etiology, pathology, and treatment. [*American Medical Gazette.*

## ARTICLE XIV.

### *Discussion on Anæsthetics in the New York Academy of Medicine.*

At the meeting of December 21st, an interesting discussion on the use of anæsthetics was incidentally started, and kept up nearly until adjournment.

Dr. Kissam related his experience with the two principal anæsthetics, sulphuric ether and chloroform, as employed in surgery; he gave preference to chloroform, but recommended it to be used with great caution.

Dr. Reese coincided with Dr. Kissam. As to the different action which the two articles possess, he would state that he was in the habit of using chloroform in puerperal convulsions, with good effect, while ether could not be used in this disease, because it rather increased, if anything, the tendency to convulsions. In reference to chloroform, he had noticed that the Paris correspondent of the *New York Times*, who was a physician, had stated that the use of this remedy had been lately attended with exceedingly fatal results in the Parisian hospitals. It was Trosseau, he thought, who had introduced and sanctioned the administration of chloroform by an apparatus in which the inhalation is made through one nostril—the other nostril being left open for the reception of atmospheric air. Great stress is laid upon the fact, that chloroform, as thus administered through the open nostril, and in such a way as to admit the atmosphere, prevents any injurious results from the accumulative action of the remedy, which are so often alarming. He had never in his own hands had a case in which the chloroform was attended by a fatal result, or even approached to fatality. He always introduced the remedy very gradually, withdrawing it occasionally, and never carrying it so far as to produce profound stertor or coma, which in no case, where the anæsthetic was resorted to, he deemed it necessary to produce.

Dr. Squib had used chloroform for the past five or six years in many cases, perhaps as often as a hundred times, for various affections, and had never seen it followed by disastrous results. He is not in the habit of giving it very profusely, very often giving hardly enough to deprive the patient of sensibility or ordinary sensation. Used in this manner, it has proved a safe agent in his hands. He had given it as long as 45—50 minutes at a time, without producing any dangerous effects. The danger from its use he considers to arise chiefly from the rash administration of it, being given in many cases so as to prevent the admission of air. When mixed with air it is certainly far more safe than when that due admixture of air is not given.

The President, Dr. Watson, stated that he would like to have the distinction pointed out between the results of the use of ether and of chloroform.

Dr. Minor: During eight years experience in the administration of anæsthetics, in the hospital to which he was attached, the free admission of atmospheric air with the anæsthetic agent has always been secured, and he had never yet met with more than one case, which appeared in his opinion to be dangerous. In that instance there was suspended animation for five or ten minutes; the patient, however, finally recovered. As a general rule, the agent is administered according to the plan laid down by Dr. Metcalfe, some years ago, in a paper which was read before the Academy. In some cases Dr. M. had seen chloroform administered, by young gentlemen, rather in a careless manner; as they become interested in the operation, they are apt to apply the sponge too closely to the patient's nostrils, and thus prevent, to a great degree, the admixture of air with the vapor of the anæsthetic. He believed that where chloroform is given with due care, and the quantity regulated according to the peculiarities of the case, there will be comparatively little danger following its use; when, on the other hand, it is carelessly or ignorantly administered, it is a dangerous remedy, and is not unfrequently followed by fatal results; in fact, he believed that most of the fatal cases can be traced to a careless administration of the remedy. These remarks, of course, referred to chloroform alone. In many instances he had used a mixture of chloroform and ether, the pecentage of the latter, however, being so small, that as far as the ultimate effects were concerned, it might be considered as chloroform.

Dr. Squib thought that in many instances a second rate article of chloroform was used. Many gentlemen are in the habit of using a sample imported from England, under the impression that they are using the article prepared by alcohol; while it is in fact that prepared by amylated ether, neither as pure nor as efficient as that prepared by alcohol.

President: I hope the gentleman does not mean to say that we use an impure article, and in this way produce unpleasant results?

Dr. Squib: I think that statistics show this to be the case.

Dr. Gardner stated that he had used chloroform chiefly, and that his experience with ether was limited. He thought that he gave chloroform in the first case of obstetrics in which it was given in New York. He had given it so far without the least hesitation. He had used chloroform principally because it supplied a want which ether failed to supply altogether. In several cases, even a pound of ether failed to produce the desired effect, which would result from only a tea spoonful of chloroform. Again, it is very generally admitted by accouchers that ether is inadmissible in cases of puerperal convulsions, which are aggravated by its use. Whenever he deemed the use of an anæsthetic advisable, he generally had resorted to chloroform, and he would remark, that even where patients are supposed to be particularly obnoxious to its use, as in organic diseases of the heart and lungs, it may be resorted to in obstetric practice with benefit, instead of leaving the patients to the injuries which may be caused by the natural efforts of a difficult and protracted labor; the danger from chloroform was, in his opinion, far less than the injury resulting from the straining efforts in these cases. Under the administration of chloroform these are mitigated; labor is carried on by the involuntary muscles principally, and as a consequence, the tax upon the heart is far less. He had great confidence in the use of chloroform in those ordinary cases of labor, where, although the patient has a large, roomy pelvis, dilated and moist vagina, and there is no reason why the labor should not terminate in a short time, the os remains rigid, and this rigidity continues for hours without apparent change, and in spite of the most severe expulsive efforts of the uterus. The patient is worn out by these efforts, and rupture of the uterus or other injuries threaten. Now, the inhalation of a tea spoonful or two of chloroform, in these cases, seldom fails to ease the patient, relax the os, and allow the speedy expulsion of the fœtus. In cases of difficult labor, with unrelaxed and rigid os, it had been his custom to resort to chloroform instead of bloodletting, opium, tartar emetic, or the warm douche, which latter he considered the next best thing. As a general rule, the *cervix of the uterus* is readily brought under the relaxing influence of the agent, while it often requires a considerably larger quantity to relax the muscular fibres *of the body of the organ*, which is very desirable in cases where the operation of turning has to be performed. Dr. Gardner remembered one case, in which he was called to attend, in company with another gentleman, where version was required; it being an arm-presentation. Chloroform was administered, and the gentleman in attendance was endeavoring to find the feet. After some fifteen minutes or half an hour spent fruitlessly, he gave it up, stating that he had reached the fundus of the uterus, but could not find the feet, and requested Dr. G. to examine the case. On introducing the hand, Dr. G. found that what the former had mistaken for the fundus, was not in reality the fundus, but the circular fibres of the organ, which were firmly contracted around the child. The feet of course were above this point, surrounded by this ring of muscular fibre, and entirely out of reach. On recognizing this condition of things, the woman was placed under the full influence of the anæsthetic. This had the momentary influence of relaxing the fibres, during which time the hand was passed through, the feet seized, and turning performed. By this means, then, we are able to perform one of the most formidable operations in midwifery with comparative ease and comfort. So far as the application of the forceps is concerned, he was not in the habit of applying them, with the patient under the full influence of chloroform; he preferred that the patient should be sensible, so that if the instrument should press against the soft parts, in a manner that may be injurious to the woman, he might be made aware of it by her movements.

Dr. Peaslee remarked that in regard to the danger accompanying the administration of chloroform, a distinction must be made between its use in obstetric and in surgical practice. In the former it is comparatively safe, because the paroxysms and labor pains react, to a certain extent, against the influence of the anæsthetic, while it is much more fatal in surgical practice. In regard to the two agents, he preferred ether; he had commenced with it, and used it up to the present time. In the first few trials, unpleasant effects were occasionally seen, which Dr. Peaslee now feels certain to have been due to the manner in which it was administered. His own experience coincided with the results of Dr. Snow's experiments, and convinced him that the safety of the administration of this agent, depends *cæteris paribus*, upon the proper amount of atmospheric air being given with it. With this precaution, Dr. P. has never seen it followed by any unpleasant consequences whatever, and furthermore, he had never known, seen, read, or heard of a case, where it was followed by unpleasant effects for more than a few hours. In some cases, he had given as much as two pounds of ether, and not unfrequently one pound. Chloroform he used with the utmost care, and took the precaution, mentioned by Dr. Snow, never to give it for more than twenty minutes at a time. In one case, however, even with these precautions, respiration was interrupted for three or four minutes, and for a time he thought that the patient was dead, and it was only by establishing artificial respiration that recovery finally took place. In obstetric practice, where there is a rigid os, chloroform has a decided influence in relaxing the muscular fibres which constitute a sort of sphincter muscle at this point; it appears to exert an almost specific influence on that portion of the uterus, almost as certainly and successfully as belladonna acts upon the eye.

Dr. McNulty thought that in considering this subject, the first question should be, what is the exact cause of death? This being known, it could readily be ascertained which of the two anæsthetics, ether or chloroform, contains the most dangerous properties. The manner in which death is produced by these agents seemed to him to be the first subject of inquiry.

The President, Dr. Watson, inquired of Dr. Peaslee, whether in the obstetric use of these remedies, hemorrhage after delivery is apt to be increased thereby.

Dr. Peaslee thought that this was decidedly the case, when chloroform is first given, there is for a short time a diminution in the power of the uterine contractions. He had noticed that on removing the placenta there was considerable tendency to hemorrhage in these cases. To counteract this, he was in the habit of giving a dose of ergot, perhaps thirty drops of the tincture ten or fifteen minutes before the delivery. Taking that precaution he had never seen any dangerous result.

Dr. H. Green had never employed ether; chloroform he had used for ten years, and with one exceptional case, which did not, however, prove fatal, had never seen any difficulty or danger from its administration. In obstetric cases he had noticed one fact, which he had not yet heard mentioned, namely, that after its administration the necessity of giving laxatives on the second or third day was obviated, the anæsthetic having a tendency to relax the bowels.

Dr. Raphael stated that in his practice he had used chloroform invariably, and had never seen it attended with injurious results, except in one instance, which occurred in a boy between fifteen and sixteen years of age, from whose neck a tumor was removed. The boy remained insensible for nearly three-quarters of an hour, but finally recovered. He believed that death was sometimes produced by a careless administration of the agent, especially when it is poured upon a sponge and placed directly over the nostrils. In this case, apart from the prevention of a free access of air, we have the irritating action of the chloroform producing a spasm of the glottis, which in some cases is, perhaps, so severe as to produce death.

[This would seem improbable as the local effect of chloroform upon muscular fibre is not to produce *contraction*, but, as Dr. Faure has shown by his experiments, when it is brought in contact with muscular tissues, it destroys instantaneously their contractibility. Taking this in connection with the facts so ably presented in the subsequent remarks of Professor Dalton, there can hardly remain a doubt, that chloroform produces death by paralysis of the cardiac muscle, whenever it circulates in sufficient quantity in the blood to exercise this, its *peculiar*, paralysing influence. Can this be avoided in every case? Not until we are able to determine the absorptive power in every individual, to measure in every particular case the resistance of the muscular fibre to this paralysing effect, which undoubtedly varies in various persons, according to sex, age and idiosyncracy; until we know all this beforehand, we will be no more able to foretell its effect, than we are, to predict, whether a certain dose of mercurial will produce ptyalism or not.—GOTHAM.]

Dr. O'Reily related four cases in which chloroform was administered, in all of which the most alarming symptoms took place suddenly, although the agent had been administered with care. By most energetic means, however, they were all restored.

Dr. Dalton made the following remarks:

Of course, Mr. President, I have very little experience with regard to the effects of these two agents upon the human subject, although I had the pleasure of witnessing the first operation in which ether was used as an anæsthetic agent. In my own practice, if you may call it such, the patients have been principally animals. I presume, however, that there is very little difference in their mode of operation on animals and on men. When I commenced, I, of course, used ether; but as ether requires to be given in a very large bulk, I soon found it very inconvenient, and commenced using chloroform in its stead, and found it very much more pleasant for myself, because it was more easily administered to the animals, and I continued to use it for a certain time. Very soon, however, I found that the animals would occasionally die, which I attributed to some imperfection in the mode of administering the agent. I continued the practice, but still the accident referred to would occasionally occur. Not to take up too much time in detail, the simple fact is, that, at the end of six months, from the time I commenced its administration, I abandoned it. Sometime afterward I again had occasion to use it; I gave it, but found that it was followed by the same results. Since that time I have given it up altogether, and instead of it I have used sulphuric ether. I think I may say, without exaggeration, that I am thoroughly convinced that there is a radical difference in the danger following the administration of these two substances. I am sure that chloroform is more dangerous to animals, at least; whether it is so in man or not, I do not know.

In order to understand this subject thoroughly, it is necessary that we should endeavor to ascertain the manner in which death results in the fatal cases. Death sometimes follows without any evident or traceable cause. It may occur from ether or chloroform by a very careless administration, or from an impurity of the article, provided that the patient breathes nothing but the vapor of the ether or chloroform. Now in these cases, death is not attributable to the ether or chloroform; it is simply due to the want of atmospheric air. If you give a man a grain of opium and then stop his mouth and nostrils, he will of course die; but certainly not from the opium, but from the want of atmospheric air. The same is true of the administration of ether or chloroform. Therefore, the first thing to be attended to, when we wish to prevent a fatal issue from the administration of these substances is to see that they are mixed with a sufficient quantity of atmospheric air, and then one cause of death would be excluded.

Sometimes, however, even with all our precaution, we find the respiration and the heart stopping suddenly and the patient dead. It is an interesting question to know whether or not death is produced by the *stoppage of respiration* or *of the heart*. My own belief is, that in the case of chloroform, death is produced by paralysis of the heart. My reasons for this view are two-fold.

In the first place, if you moderately etherize or chloroformize an animal, carrying it carefully just up to the point of insensibility, and then open the walls of the chest as quickly as possible, the lungs will of course, collapse, and respiration be at an end, but the heart will continue to beat for a considerable length of time. If, on the other hand, you etherize or chloroformize an animal until respiration is stopped, and then open the chest, you will find the heart still beating, but very feebly. I have several times performed the following experiment, namely: to etherize an animal moderately, but enough to deprive it of all sensibility, then immediately the chest was opened and the animal laid aside; another animal was then etherized until death was produced, and on immediately opening the chest the heart was found still, while in the first animal it was yet beating. So far as this goes, it tends to show, with a great deal of conclusiveness, that the fatal result is produced by a direct paralysis of the heart.

In experimenting thus with animals, I have had occasion to notice very frequently, when the anæsthetic is carried only to the stoppage of respiration, that the animals usually recover, and expect with confidence that respiration will begin again; but if, on noticing that the respiration is stopped, I find the heart itself still, I know that the animal is dead, although I have noticed, after the circulation is at an end, that it is sometimes re-established in a certain manner which is entirely characteristic, and being once seen, is very readily recognized. This is, however, entirely unavailing; the animal never recovers.

In my own experience, then, fatal results have followed both ether and chloroform. I have killed dogs and cats with ether and chloroform, but I am obliged to take a great deal of pains to produce this result with ether, whereas death often follows the use of chloroform, notwithstanding the best precautions. It has been said, that when death occurs from the administration of chloroform in the human subject, that it is attributable to giving it too rapidly or too abundantly; but while there are undoubtedly many cases in which injurious results follow from the non-admission of a sufficient amount of air, still I am of the opinion that the injurious or fatal results cannot be always attributed to that cause, for the reason that these accidents have occurred in the practice of our best and most careful surgeons, who invariably exhibit this remedy with the utmost caution, and yet, when every thing appears to be going on well, the patient suddenly dies. So far, we know of no precaution which will prevent the occasional occurrence of this accident.

President: I would inquire of Dr. Dalton whether the effects of these agents are cumulative?

Dr. Dalton: I cannot say that they are. Anæsthetics taken in by the lungs enter the blood so very quickly that I should not think there would be any cumulative effect.

President: In some cases the patient seems to recover so as to speak, and yet in a few moments dies. Did you ever see anything of that kind in animals?

Dr. Dalton: The only thing I have seen analogous to that, is the spasmodic respiration after the stoppage of the circulation, which led me to believe, when I first saw it, that the animal would recover, I now know, however, that these efforts are entirely unavailing. When once the heart has ceased to pulsate, the animal is dead.

Dr. O'Reily gave his theory of the fatal action of chloroform. In his opinion, the anæsthetic acted primarily upon the ganglionic nervous system, by which the proper process of endosmose and exosmose in the lungs is disturbed, and the air cells in the lungs are prevented from duly decarbonizing the blood.

Dr. Buck related the history of the death from chloroform which occurred several years ago at the New York Hospital. The patient in that case was a perfectly healthy man. Two weeks before the unfortunate accident occurred he had taken chloroform, which produced no disagreeable result whatever, neither were any greater precautions taken at this time than when the fatal issue occurred. In his case there was nothing whatever to forbid the use of this agent. Neither can the unfortunate result be attributed to the impurity of the chloroform, for the same article had been administered a day before to one of the patients, with the very best effect. In this instance the quantity was by no means large, certainly less than a drachm. The accident occurred very suddenly indeed. Dr. B. had barely time to order the assistant to bring a wet cloth, and then felt of his pulse, but it was gone. He did not know how any greater precautions could have been used than had been in this case.

Dr. Batchelder: had tried experiments with chloroform upon himself frequently, by inhaling it through one nostril while the other was stopped, and then watching the effects closely. At first a singing in the head and ears were felt, then flashings of light before the eyes, assuming various shapes, were seen, and a prickling sensation was felt in the fingers. If carried beyond this point, it begins to affect the voluntary muscles, so much so that in some instances he would have fallen down if he had not stopped inhaling the agent. In relation to the manner in which it produces death, he agreed entirely with Dr. Dalton's views. He thought that the heart did not become paralyzed until all the voluntary muscles had become so. He had seen but two cases in which the agent produced alarming symptoms. They were both surgical, and were rescued by inducing artificial respiration.

Dr. Gardner regarded the minimum dose of 20 drops, as generally stated in books, as too large. In one case he had seen a sufficient anæsthetic effect produced to allow the painless extraction of a tooth, by the inhalation of only 5 drops of chloroform.

As regards the internal administration of chloroform, reasoning from the effects of ether in this way, he had used it quite largely at the time when cholera was prevalent, but it did not seem to produce any effect at all. Since that time he had given it frequently in various gastric and intestinal diseases, but was unable to observe any beneficial effect whatever.

Dr. McNulty observed that from the turn which the discussion had taken, one would draw the inference that sulphuric ether was a perfectly harmless and safe agent, and could be administered almost *ad libitum*. He certainly had that impression very strongly. Last week, however, he had occasion to administer sulphuric ether to his own brother, and of course all possible precautions were used. He was put in the recumbent posture, and an abundance of atmospheric air was secured with the vapor inhaled. For the first five minutes the proportion of ether to air was certainly not more than 1 in 20, perhaps only 1 in 50. From that time its administration was carried on very gradually, and he was apparently coming under the influence of the anæsthetic very well indeed. Suddenly, when looking at his face, he was struck with its remarkable pallor. On feeling the pulse it was found a mere flutter; the respiration had also ceased. The sponge was immediately taken away, and Marshall Hall's ready method resorted to. The patient gradually came to, but did not fully recover until six hours afterward. This case, the Doctor remarked, has certainly shaken my confidence in the safety and harmlessness of this remedy very much indeed.

The President, Dr. Watson, inquired of Dr. Dalton whether he had found ether *fail* to produce all the effects that can be wished for from chloroform.

Dr. Dalton: It has never failed in my hands. My experience would lead me to believe that it is capable of producing all the effects of chloroform.

Dr. McFarland remarked that he had been in the habit of using chloroform internally quite largely. His experience was directly contrary to that of Dr. Gardner. In the ordinary cases of flatulentia enterica he had used it with almost uniform success, in many cases relieving the pain in a very few minutes. But now for a more remarkable case, one of *colica pictonum*, which occurred in a painter who had been working in a room which had to be closed on account of the coldness of the weather. The close confinement brought on an attack of colica pictonum, for which Dr. McF. attended him, and carried him through by means of morphia, croton oil, and iodide of potassium. Not long after, he had a second attack, which was very severe. After having given him morphia, croton oil, and iodide of potassium, without producing the desired effect, the Doctor concluded to put him upon the internal use of chloroform. He first gave him 20 drops, which was very soon vomited up. He then gave him ten drops every half hour until he had taken six or seven doses, when all the distressing symptoms disappeared, and strange to say, his bowels became relaxed, and he had copious evacuations. The chloroform was administered for two days. The iodide of potassium was given to counteract the effects of the lead, a few days after the exhibition of which the blue line around the gums disappeared. He was, however, again attacked some time later, having worked as before in a closed room. On this occasion the chloroform treatment was at once resorted to, and it had precisely the same effect. Now, if such a simple remedy as that will relieve a case of colica pictonum in one instance, it is certainly worthy of trial in another. [*Med. and Surg. Reporter.*

## ARTICLE XV.

*Hypnotism.* Translated by O. D. PALMER, M. D., Zelienople, Pa.

> Hoc Gallicæ consurtudinis—
> Rumoribus aque auditionibus permoti,
> Summis sæpe rebus consilia ineunt.
> *Cæsar's Com. lib.* 4.

AN enthusiasm amounting almost to ecstacy, has been recently produced in the scientific world of Paris, by the supposed discovery of a new method of effecting anesthesia. This novel method, which bears the appellation of *hypnotism,* is made to consist in a species of extemporaneous strabismus, caused by conveying the axis of the eyes to a point a few inches from the root of the nose. In this operation, certain muscles, the *recti superioris,* and the *levatores palpebrarum,* are in a state of forced contraction, and the continuance of this action, during a period varying from three to fifteen minutes, superinduces a state of the sensorium, identical with catalepsy, or at least analogous to it, called a hypnotic state. The extracts which follow, translated from recent copies of the *Gazette Hebdomadiare*, will give some intimations of the discovery, introduction, reception, and success, of this marvellous agent, now monopolizing the attention of that metropolis of science and civilization, Paris.

A young provincial surgeon, Dr. Azam, adjunct professor in a school at Bordeaux, brought to Paris this singular method, the fruit of prolonged studies and numerous experiments, patiently instituted, during a long period. Eighteen months since, he had occasion to attend a young hysterical patient in spontaneous catalepsy. He observed in her exceedingly curious facts, which it does not come within our province to relate here. A professor in the Academy of Sciences, Dr. Bazin, being instructed by his experiments, advised Dr. Azam to examine an English work, published in 1842, by M. Braid, and in which is found indicated a means of producing artificial catalepsy, and anesthesia. Dr. Azam, having procured the work, of which there is given an analysis by Carpenter, in the Cyclopedia of Todd & Bowman, (article *Sleep*,) he instituted upon this young cataleptic, and nearly thirty others, numerous experiments. He ascertained the greater part of Braid's assertions to be substantially correct, among others, that catalepsy and anesthesia could be procured at will, by proceeding in the following manner:

The subject is sitting or lying in a convenient position, the operator puts before his eyes, at some three inches distance, and generally within the point of distinct vision, a bright body, on which the eyes are to be directed, and fixed continuously; the body should be so placed, that the eyes are directed upward and inward, by the firm contraction of the proper muscles, causing convergent strabismus. Hardly has this fatiguing attitude been preserved in for two or three minutes, till we see the pupils contract, and then dilate, the palpebra oscillate rapidly, and then fall down, and immediately the subject is asleep. Two symptoms attend this state, catalepsy precisely as described in the class books, and anesthesia, enduring from three to fifteen minutes, complete or incomplete, but which generally permits pinching, pricking, and tickling, without the least trace of sensibility, or without modifying in the least the cataleptic state. This state of anesthesia is usually succeeded by the opposite state, of hyperæsthesia, in which we see the ordinary senses, the sensation of temperature and of muscular activity, attains a degree of more than usual impressibility; at any moment of the experiment, the symptoms can be made to suddenly cease, by frictions and sufflations of cold air on the eyelids, in a similar manner to what has been seen in the researches of Dr. Paul on catalepsy. The subjects, returned to their normal state, preserve no remembrance of what has passed during the preceding moments.

The gentlemen engaged with this subjeet specially, Drs. Azam, Broca, Fallen, and Velpeau, merit at least an examination, and they should not be assailed under what pretext soever, with incredulity, or even obstinate doubt. It has been a long time a reproach to the learned, their proud disdain for the extraordinary. We are in an epoch, in which all that is announced under a serious mien, and proceeds scientifically, merits examination; we live in a time, in short, when it would be unreasonable to turn away the eyes, merely because what is shown us is simply improbable and marvellous. Furthermore, the better way, and indeed the only, to judge anything, consists in at first looking it in the face, and this is what has been done by the grave men we have cited; this is what we have undertaken to do ourself. We will merely add, that Dr. Azam has arrived in Paris, fully persuaded that surgery was in possession of a new anesthetic. The readers may judge from the following, of the value of this impression.

We hasten to lay before our readers a case by an ancient colleague, a distinguished provincial surgeon, Dr. Gruri-neau, adjunct professor in the secondary school at Poictiers.

In the case that follows, we have not to do with an impressible woman, hysterical, and predisposed, by a nervous fantastic system, to extatic manifestations, more or less poetic and marvellous. The subject was a peasant, a little nervous, lymphatic, exhausted, and anything but a stoic.

*Case.*—George Jarry, aged thirty-four years, from the village of Mortimer, had been treated for several months in a hospital, for a white swelling of the left knee. So painful was this knee, that the least motion caused the patient to cry out. He had given his consent that the leg should be amputated at the thigh.

I operated in the presence of several distinguished surgeons. One of them held a spatula within about three inches of the root of the nose of the patient, whilst lying in a horizontal position. Strabismus convergent upward, was promptly produced.

Five minutes had elapsed, since his eyes had been fixed upon the spatula; I raised the left arm up, and let it go; immediately it fell. Then there was no catalepsy. The patient said we would not be able to put him to sleep by this process. I immediately recommended the greatest silence in the apartment, where numerous parties had begun conversations: I spoke no further to the patient, who eyed the spatula with perseverance. After five minutes of the most profound silence I performed amputation of the inferior part of the thigh, by the double flap operation. During this operation, which lasted a minute and a half, the patient did not make the least plaint or motion; I now spoke to him, and inquired how he was. He said in answer, he thought himself in paradise, and seizing my hand carried it to his lips. During the operation his eyes were affected by a twitching movement. They had the appearance of searching for the spatula. A student, pinching his thigh a couple of minutes before the operation, asked if it gave pain, "O, I feel it a little," said he. After the operation, Jarry said "he knew the time the leg was cut off, for at that period, they asked him if he had any pain." Now it was two minutes after this interrogation, that the operation commenced, and during all the time of this, his visage offered not the least spasm or contraction. All this time the eyes of Jarry seemed to search for the spatula.

It was quite evident to the assistants, that the patient did not experience pain, as he did not make the least plaint, whilst previously he cried out on the least motion of the affected limb.

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When Dr. Azam reads the above, he will, without doubt, experience a lively satisfaction; he will find in it encouragement to pursue it, without too much pre-occupation with certain malevolent checks. We wish, moreover, he may induce anæsthesia of his auditory nerves, until the uproar of skeptics shall be appeased. As for our own part, without abdication of any doubts, or any philosophic prudence, we continue to observe and to reflect.

AR. VERNEIUL.

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The following case appears to have occurred in Paris.

*Case.*—Woman aged twenty-four years—extensive burn of back and right limbs—abscess of the verge of anus, voluminous, and very painful—weakened by pain, and otherwise pusillanimous, greatly fears incision—was told she would be put to sleep—a copper cylinder, (Brick's lunette,) placed three inches before root of nose—patient to see this object, was obliged to squint strongly; pupils immediately much contracted, pulse rapid previous to experiment, first a little accelerated, then becoming feeble, slow; two minutes are passed, pupils dilate, left arm raised vertically from the bed; remains immovable in that position; toward fourth minute, answers are slow, laborious, but perfectly sensible; respiration slightly affected. At the end of five minutes M. Follen pricks the skin of the left arm, in vertical position; no movement; pricks again, giving rise to a drop of blood; passed equally unperceived, right arm placed in attitude same as left arm; laid bare seat of abscess; patient permits all, quietly saying she fears to incur some injury from us. In short, seven minutes after the *debut*, Dr. Follen made a large opening into the abscess, which gives issue to a large quantity of fœtid pus. A light cry, lasting less than a second, was the only sign given by patient of feeling; otherwise not the least twinge in the muscles of the face, or limbs; arms have constantly maintained the attitude first given them.

Two minutes more, the position ever the same; eyes ever wide open; a little injected; the visage impassible, the pulse as before the experiment; the respiration perfectly free, the subject always insensible. We raised the right foot, it remained suspended in the air; the cataleptic state of superior limbs present.

Dr. Broka removed the bright body, which had constantly been kept before the eyes: he used friction over the eye-lids, and a stream of cold air. The patient made some little motion. She was asked if anything had happened to her. She answered she knew of nothing. The three limbs remain still in the attitude given them. Pricking again upon the left arm is not perceived. Eighteen minutes after the commencement of the experiment; twelve minutes after the operation, friction again, sufflation again on palpebra; sudden awaking; the members in catalepsy fall all at once. The patient rubs her eyes, and resumes her consciousness. She remembers nothing, and is astonished at having been operated upon. Her state is comparable, as far as a certain point, to that of an individual who has come out of an ordinary anæsthetic sleep. Always the waking is more sudden; without agitation, and without loquacity. The anæsthesia, interrupted by the provoked waking, has lasted at least fifteen minutes.

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We understand that Azam has succeeded in anæsthizing a young girl under the eyes of Prof. Trousseau, very promptly, and all leads to the belief that these experiments will be multiplied.

We ought merely to anticipate, that some subjects show themselves altogether refractory to *hypnotism*.

We wish, in conclusion, to forewarn our brethren, against too sudden an enthusiasm, as well as against an ultra skepticism. We should study the question coolly, calmly, and patiently. The promoters of this discovery, as well as those who seek to propagate it, do not wish to deceive, or to be deceived. [*Ed. Gaz. Heb.*

# EDITORIAL DEPARTMENT.

*Gold Containing Antimony*—Mr. Warrington has recently called the attention of the Chemical Society of London, to the existence of an alloy of gold very troublesome to those who work that precious metal. He first met with it in a bar of Australian gold, said to have been obtained by the quartz-crushing process, which looked very well on the outside, but when broken, proved to be grayish yellow, and crystalline within. It was extremely brittle and utterly unfit for rolling or mixing with other gold, to which it communicated its own bad qualities. Much of this sort of gold had been brought in, and the royal mint had returned to the Bank of England, as unfit for the purposes of coinage, 47,000 ounces of it. The following tables express the composition of two samples of this gold, No. I, representing the constitution of the original bar, and No. II, that of a second specimen, both examined by Mr. Warrington.

| | No. I. | No. II. |
|---|---|---|
| Gold, | 92.40 | 93.80 |
| Silver, | 4.60 | 2.20 |
| Antimony, | Trace. | 2.28 |
| Tin, | 2.00 | 1.40 |
| Arsenic | | Trace. |
| Copper, | 0.75 | do. |
| Loss, | 0.25 | 0.32 |
| | 100.00 | 100.00 |

Mr. Warrington is inclined to attribute the presence of antimony to an attempt to refine the gold by the use of sulphuret of antimony, which is sure to contaminate the precious metal unless great precaution is used. The tin may have been introduced at the mines, as a good deal of stream tin comes from Australia.

Mr. W. suggested a very simple and cheap expedient for getting rid of these troublesome metals. It is to oxydize them at the expense of some metallic oxyd, having, at high temperatures, a weaker affinity for oxygen than the metals in question. Nitrate of potash will not answer the purpose owing to its low specific gravity. Oxyd of copper is the substance preferred by our author. The gold to be refined is mixed with ten per cent. of this oxyd, and a small quantity of borax, and kept in fusion with them for half an hour. The result is a perfectly malleable gold, containing a small per centage of copper. The proportion of the oxyd of copper must, of course, vary with the quantity of oxydizable metal to be removed. The tyro in chemistry must bear in mind another practical fact, which is, that black-lead crucibles cannot be used for this method of refining, as the oxyd of copper would be reduced by the carbon of the crucible, while the antimony would not be affected by it.

During the discussion which followed the reading of this paper, it was mentioned that the gold made from sweepings of book binders, &c., was frequently contaminated by antimony in consequence of the accidental admixture of loose type. It is well for dentists to be on the look out for these unmalleable qualities of gold.

* * *

*Newspaper Literature.*—We call the attention of our readers to the following timely comments upon a great and growing evil. No one who has observed the course of the public press, can fail to recognize the justice of the reproof. It may be that these miserable sheets are preparing the way for something better. If so, God grant they may soon finish their work, and stand aside forever.

We copy from the Boston Medical and Surgical Journal.

"For a long time we have noticed with regret a marked change in the character of the contents of our daily papers. Some years since, certain matters were considered unfit for publication, except in the lowest journals, the presence of which in any respectable family would have been regarded as a disgrace. Now, however, it is almost impossible to find a newspaper which does not contain, upon every page, something which should never meet the eye of any member of a household.

"It was, therefore, with no little pleasure that we read some remarks upon this subject by Dr. Ray, in his report on the Butler Hospital for the

Insane. After calling attention to 'the unquestionable fact that insanity is increasing in all civilized communities,' he speaks of the influence of the law of imitation upon the human mind, and very justly remarks that—

"The slightest examination of this our modern life will show us a host of agencies belonging to the ordinary routine, which, by means of this law of sympathy and propensity to imitation, produce an unhealthy tone of feeling, which not only deranges the proper order and balance of the moral sentiments, but often terminates, at last, either in unequivocal disease, or in conduct where the element of moral depravity is mingled in some uncertain proportion with that of cerebral disorder and disease. In no age of the world, have these agencies been so effective or so numerous, as at the present. Far above and beyond all others is that of the press, whose power, during the last sixty years, has been extending at an unexampled rate. There is not a single phasis of human passion, not a single combinanation of its various elements, not a single development of its slumbering activities, not a single abnormal deviation from its ordinary channels, not a single manifestation of its effects on actual life, which is not displayed by the public press in the strongest colors which an ambitious rhetoric can give it. And thus, too, those sad and fearful chapters in human experience which, though filled with woe to the parties immediately concerned, once were scarcely known beyond the limits of a little community, are now presented to every reader in the land, with every circumstance that can add force or piquancy to the narrative. The columns of a single newspaper, without exaggeration, it may be said, contain more materials for stirring the sympathies of men, for good or for evil, than the unwritten lives of countless multitudes. They occupy the leisure moments of thousands, which would otherwise be given to listless rest, and furnish inexhaustible materials for thought or emotion—the only kind, perhaps, which they ever obtain. The ephemeral sheet which to-day is, and to-morrow is cast into the oven, goes forth on the wings of the wind, scattering its hetrogeneous influences upon every description of person. A murder or a suicide, a breach of trust or an audacious robbery, committed in the obscurest corner of the land, is proclaimed to all the world. The details of a disgusting criminal trial, exposing the darkest aspects of our nature, find an audience that no court-room less than a hemisphere could hold. ○ ○ ○ ○ ○

"It is a common impression that the newspaper merely ministers to the natural curiosity of men to know what is passing around them; but it has another and a far more important effect. It is not every occurrence, whose communication to the world can be productive of unmingled good. For reasons just given, no small proportion of those which are thrust upon the reader's attention, leave a positively unhealthy impression; and when we consider that, besides the multitudes who, in addition to other reading, never pass a day without looking over a newspaper, there is a scarcely smaller number who read nothing else, we may get some faint idea of the magnitude of this result. The details of vice and crime which occupy so large a space in the daily sheet, repeated day after day, familiarize the mind with their hideous features, and thus blunt the edge of its finer sensibilities. The effect of it all is, that the mind not only becomes careless of moral distinctions, but incapable, in some degree, of perceiving them; its relish for the simply good and beautiful and true, is lost, and in its place we find an insatiable craving for what will create a strong sensation, and a positive sympathy, perhaps with wrong, and wrong-doers. By a well-known law of the animal economy, excessive activity of a function, leads at last, to a morbid condition of the organ; and thus it is that this kind of mental activity becomes a prolific source of cerebral dsorder—not of the more palpable forms, such as inflammation or softening, but of a degree of irritability or abnormal erythism which often terminates in overt disease."

"With the best of intentions, he partially exonerates the press in the following words:

"Far be it from me to lay the blame of all this mischief at the door of those who manage the newspaper-press. In responding to the call which is made for the kind of news in question, they believe, honestly, no doubt, that they are complying with a reasonable wish, and laboring worthily in their vocation. It is not for them, in exercising this function, to scrutinize too closely the remote and indirect effects of what they communicate, upon the minds of their readers. The fault really lies in the public taste which craves and demands such reading; and the true remedy consists, not in blaming the people connected with the press, or addressing to them philosophical reflections on the operations of the mind, but in refining and elevating the public taste, by improving our methods of education, and multiplying the means and appliances of a higher and sounder cultivation. This, certainly, is not very specific, and promises no immediate relief; but so it ever must be with all reforms that effect the exercise of the passions and propensities."

"We sincerely hope that such words, however kindly in their tone, may be regarded as a decided reflection upon the editorial corps. It is no compliment to tell them that they are always to *follow* and never *form* public taste; that they may legitimately vary their standard of morality in accordance with changes in public opinion; that, instead of using their almost unlimited power for the benefit of mankind, they may exert it in promoting the worst of causes, and be the most active agents in the demoralization of society.

"There are but three sources to which this great evil can be traced:—to a belief on the part of editors, that what they furnish is to be a real benefit to those who read; to negligence; or to the trading spirit, which is always ready to sell anything which the most morbid appetite may crave.

"That the first is true, we have not the credulity to believe; the second may happen occasionally, but will not explain the vitality and persistence so strongly manifested; the third is, probably, in most instances, the only correct solution.

"If the true remedy consists, as we are told above, 'in refining and elevating the public taste,' what more potent element can we call to our aid than this same public press, and, if this fails us, where shall we look for help? Those who thus have the power of purifying or corrupting the minds of the people should, we think, receive the first attention, and be taught, if they do not understand it now, the responsibility which rests upon them."

* * *

*Platina and its Accompanying Metals.*—We give in this number the commencement of an elaborate and able memoir on this subject by the well known French Metallurgists, St. Claire Deville and Debray. Although much of the detail given may appear to be of merely scientific interest, yet we have preferred to furnish our readers with the memoir in full, as information is needed upon the subjects of which it treats. Platina is largely used in dentistry, and its cost is so great that nothing which throws light upon the utilization of its residues can be considered superfluous.

* * *

*The New Arctic Expedition.*—Dr. I. I. Hayes, who was attached to Dr. Kane's expedition in the capacity of surgeon, and who has had large experience of Arctic travel, is now organizing another Arctic voyage of discovery. Taking the open Polar sea discovered by Morton as a fixed and constant fact, he recognizes, as the only barrier to shut us out from the mysteries of the Pole, the belt of ice which floats around those undiscovered regions. Once penetrate this, and an open sea will receive the adventurous voyager, who can then unveil all the wonders which have been slumbering in these silent wastes since the creation. What will he find? Do the shores of that vast ocean swarm with birds? Does that frosty air echo to the rustle of innumerable pinions, or does it vibrate only to the sound of the fall of icebergs, and the crackle of the darting columns of the Aurora Borealis? Are its green depths stirred by the rush of fishes and great whales, and do their billows laugh and sparkle in the sun, or is all silent in the abyss, and is the surface locked in fetters of eternal frost? Are there human beings on any of the lands within that mysterious circle, and if so, who, how came they there, and what are their relations to the race?

How will the magnetic needle behave over that silent centre of the whirling earth? What phenomena will the Aurora Borealis display in its distant and unknown home? What becomes of the Gulf-Stream, that wonderful river rushing through the ocean, when it has swept beyond the rocky capes of Norway? Are those regions scourged with storms, or is there an eternal quiet brooding over the axis?

Who can answer these questions? The wide belt of ice, with its frowning battlements of icebergs, warns us back, and guards well the mysteries entrusted to its care. But Dr. Hayes thinks he can burst through the barrier, and bring us news from the inner circle. We wish him God-speed in his enterprise—a successful voyage and a safe return.

The prospect of the speedy organization of the expedition is good. The minimum amount named by Dr. Hayes is nearly subscribed, but we hope to see more liberal contributions. It is a matter of great interest, and should command the attention of all who profess any concern for the advancement of science.

* * *

*Maryland and Virginia Medical and Surgical Journal.*—The Virginia Medical and Surgical Journal has now two offices of publication, Richmond and Baltimore. The Richmond editorship remains, as before, in the hands of Dr. McCaw. The principal Baltimore editor is Dr. Chew Van Bibber. Knowing the latter gentleman as we do, we can sincerely offer our hearty congratulations to the subscribers of the Journal upon their good fortune in obtaining his services. He has secured the co-operation of a number of medical gentlemen, well known for their devotion to science, and their literary and professional abilities. The recent numbers of the Journal prove that the editors are not only able, but willing to furnish their subscribers with a first class medical monthly, and we commend to the favorable consideration of all who wish to keep up with the progress of medicine.

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## NECROLOGY.

*Professor Charles Frick.*—It is with a grief we are wholly unable to express that we announce to our readers the untimely death of the distinguished Professor of Materia Medica and Therapeutics at the University of Maryland, Dr. CHARLES FRICK. So suddenly has this calamity fallen upon us, that we are still scarcely able to regard it as anything but a hideous dream, from which we long to awake.

He fell in the faithful discharge of his duty, and has thus added another name to the muster-roll of that "noble army of martyrs" who have sacrificed themselves to save the lives of those entrusted to their care. The circumstances of the case were these: A poor negro woman had contracted *diph-*

*therite*, or malignant sore throat, and was sent to the Infirmary attached to the University of Maryland. Dr. Frick, being in charge, gave her the only chance for life by performing the operation of tracheotomy. Most unfortunately, he contracted the disease himself. The operation was performed on Tuesday, the 20th of March. On Wednesday the Doctor himself was taken ill, and by Sunday morning, such was the extension of the false membrane into the larynx and trachea, that he was only saved from immediate asphyxia by the same operation. The larynx was opened early in the morning, and the patient experienced some relief. Unhappily, however, this was but of short duration, as he sank and died about noon of the same day, the 25th of March.

Thus perished, in the prime of his life, in the full career of usefulness, one of the most eminent of our medical men. The chasm he has left it will be difficult if not impossible to fill. A skillful and observant physician, who took broad, philosophical views of his profession, and thought profoundly and originally upon the various questions of medical science and art, his loss as a teacher will be most acutely felt by those young men he labored so zealously and successfully to instruct. The death of such a man exerts its influence far beyond the immediate time of his decease. Those habits of thought his example and precept were so sure to inculcate upon the students who listened to his expositions of disease and remedies, can only be acquired by careful training under an original thinker like himself. Not only the medical profession, however, but the entire community feels his loss. His death has cast a profound gloom over the whole city. His native amiability and goodness of heart won the love of all who were so happy as to know him intimately, while his graceful and attractive manners secured the admiration of the most casual acquaintance. It is doubtful if he ever had an enemy—certainly he never deserved one. Of him we can most emphatically say,

> "None knew him but to love him,
> None named him but to praise."

It was our intention to give a fuller account of the life and labors of this amiable and accomplished gentleman, but not having at present a complete list of his contributions to medical science, we shall defer it until July.

*Baltimore College of Dental Surgery.*[*]—The Twentieth Annual Commencement of this Institution was held on the evening of February 28th. On that occasion the following gentlemen received the degree of Doctor of Dental Surgery, with the usual ceremonies :

| | | Subjects of Theses. |
|---|---|---|
| Amzi W. Alexander, | N. C. | Extracting Teeth. |
| James B. Bean, | Fla. | Pivot Teeth. |
| Thomas E. Bessellieu, | S. C. | Dental Etiquette. |
| Charles Billingslea, | Md. | Effects of Diseased Teeth. |
| John Bland, | Ark. | Inflammation of the Mouth. |
| Hugh P. Bone, | Ala. | Inflammation. |
| Memory Bonner, M. D., | S. C. | The Saliva. |
| Abiel Bowen, | N. Y. | Preparation for Artificial Dentures. |
| Conrad S. Boyd, | N. C. | Teeth and their Diseases. |
| William N. Cunningham, | La. | Irregularity of Teeth. |
| Wm. B. Dennis, | R. I. | Primary Dentition. |
| John H. Dickson, M. D., | S. C. | The Natural Teeth. |
| John W. Doniphan, M. D., | S. C. | Fractures. |
| Charles E. Dunn, | Ky. | Mechanical Dentistry. |
| Wm. C. Dunnavant, | Va. | Dental Education. |
| William H. Gates, | Ga. | Filling Teeth. |
| Charles O. Hall, | Conn. | Vulcanite Basis. |
| Thaddeus Haynie, | Va. | Filling Teeth. |
| Thomas M. Henly, | Va. | Caries and its Treatment. |
| J. Carroll House, | N. Y. | Impressions and Metallic Dies. |
| P. Fernando Hyatt, | Penn. | Odontalgia. |
| Theodore A. Lafar, | S. C. | Ætiology of Odontalgia. |
| John M. Lazier, | Va. | Salivary Calculus. |
| George C. De Marini, | R. I. | Salivary Glands. |
| David R. McCallum, | S. C. | Dental Education. |
| Adam H. May, | Penn. | Organs of Mastication. |
| John S. Moore, | N. C. | Extraction of Teeth. |
| Henry H. Nelles, | Canada. | Odontography. |
| Perry Ould, | Md. | Mechanical Dentistry. |
| George Paterson, | Ga. | Ætiology of Odontalgia. |
| Daniel E. Provost, | N. Y. | Odontology. |
| C. Dighton Seward, | Texas. | Teeth and their Diseases. |
| J. Vernon Simmons, | Md. | Tic Douloureux. |
| Archibald Small, | N. C. | Dental Mechanism. |
| Benjamin Smith, | Md. | Dental Caries. |
| Samuel Stoddard, | Va. | The Animal Kingdom. |
| B. S. Traywick, | N. C. | Inserting Pivot Teeth. |
| William H. Waters, | Vt. | Neurology. |
| C. A. Woodward, | R. I. | Development of the Teeth. |

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[*] This notice was overlooked at its proper place.

After the conferring the degrees, Professor Bond delivered the valedictory.

It may be gratifying to the friends of the College to state that the last class—numbering seventy students—was the largest ever in attendance at any course of dental instruction.

The prize offered by Dr. Mallet, of Connecticut, was awarded to Geo. C. De Marini, for his thesis on "The Salivary Glands." It will be found in another part of the present number of the Journal, illustrated by Dr. De Marini from dissections made by him at the College during the past winter.

Ten other theses, of those presented in competition for the prize, were mentioned by the Committee of Award as highly creditable.

*Contributions to Operative Surgery, and Surgical Pathology, by Prof. J. M. Carnochan, M. D.* Part three. 4to. 1860. Lindsay & Blakiston, Publishers, Philadelphia.

In announcing Part Three of this valuable work, we again recommend it to our readers' attention. It is, in fact, indispensable to all who desire to become acquainted with some of the most remarkable and important achievements of modern surgery. The part before us, among other articles, contains some remarks "on the Restoration of the Entire Upper Lip, with Cases." This will be found particularly interesting and instructive. It relates to an operation lately performed for the first time in this country, by Professor Carnochan, with complete success.

*Societies.*—A stated meeting of the Pennsylvania Association of Dental Surgeons was held on the evening of December 6th, 1859. The subject of discussion was the Different Methods of Preparing and Using Gold Foil in Filling Teeth. It was participated in by many, and some excellent remarks were made. The same Society met again, January 17th, 1860, when Dr. J. Hayhurst read a paper, Diptheritie Pharyngitis; after this paper, dental instruments came up for discussion.

The Michigan Dental Association held a meeting on the evening of January 15th, at Detroit. Essays on Difficult Dentition, and on the Effect of Diseased Teeth and Gums on the General Health, were read.

The Indiana State Dental Association met January 3d, 1860. Many interesting subjects were discussed, and a scale of professional charges were recommended for adoption.

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## ORIGINAL COMMUNICATIONS.

### ARTICLE I.

*The Distressing Nervous Symptoms in an Habitual Smoker, which resulted from his Abstaining from the Use of Tobacco.* By DR. J. LEVISON, of London.

*To the Editors,*
*Sirs :*

Some years since the writer of this article published a paper in the "Medical Times," on the Diseases of the Fangs Peculiar to Smokers; in which it was shown that this disease was confined in a majority of instances, to the destruction of the periosteum; and that when the roots thus deprived both of protection and nutriment, that they gradually suffer from absorption at their extremities, that ultimately the fangs are merely extraneous bodies, and as a consequence, great local irritation followed. That in this "smoker's disease," there was induced the most agonizing suffering, similar in kind to acute *tic douloureaux.*

But the following case shows that there may result many morbid symptoms by abstaining from the use of tobacco after a habitual practice of many years standing; and yet that it would be most wise and thrifty not to render necessary for the system a poison so deadly in its nature.

Without any further preface we will state the case as one worthy of the consideration both of the physiologist and pathologist. We may state that the sufferer was a professional man, a native of Essex, (a county in England,) that his father was a German and his mother English. From boyhood he had been used to the society of learned foreigners, who invariably discussed politics, religion, philosophy, literature and the arts, with their odorous meerschaums, so that from mere imitation he acquired an early inclination for the Indian weed, and actually commenced the habit at the age of thirteen.

Years rolled on—he had passed through his novitiate, had been a great traveler, and ultimately settled down a practitioner of surgery. He married and had a rather large family, and during all these years he had continued to smoke cigars or pipes, (when not engaged in his profession,) but invariably so when either reading or writing. This routine practice he continued until the age of thirty-seven, when owing to the circumstance of having a female relative on a visit to him, who after returning to his house from a walk, became so affected with the fragrant fumes of his pipe, as to cough most violently for a very long time; this so annoyed him that he vowed that he would cease to indulge in such a selfish practice, if by so doing he must cause pain, and thus unwittingly injure any one. And with a magnanimity our smoker smashed his pipe, saying, "now I have broken the spell, and shall henceforth renounce the use of tobacco, with all its soothing pleasures for ever." Poor fellow, he knew not what he vowed, or what tortures he would inflict on himself as the consequence of this rashness.

He was in his habits a teetotaler, although not a pledged one; and was *very* fat, having the outward and visible sign of an extremely nervous temperament.

"A lean and hungry look."

Not long after his anti-smoking determination, he suffered from a most curious and painful annoyance, an almost constant noise in his head, which described a booming sound, like the rush of mighty waters, or as if he had been placed between the Pacific and Atlantic oceans, and heard the hollow sounds of the rolling waves. And so far as to the fact of the noise, it was real and not imaginary, for whenever he laid his head on the pillow, his wife could hear it in the same manner as may be heard in the silent hour of night the audible sounds of a heart strongly palpitating.

From his own knowledge he was aware that these sounds arose from too active vascular circulation, but he never entertained the idea what was the predisposing cause. He had, as he related, the advantage of a multitude of medical counsellors, but though he admitted that they were wise in their generation, yet in his special instance they did not manifest their usual sagacity.

In proof of this, he cited among other evidence, that he sent to consult an M. D., who had devoted himself to affections of the brain, and of the nervous system generally, when the following conversation took place, which we report without comment.

PATIENT.—"My dear doctor, I have come to consult you, and accordingly he detailed the disagreeable symptoms already mentioned, and then added, "That besides the noise in his head, he had some horrid morbid affection of the sphincter muscles of the rectum, which was so agonizing when passing fecal matter, that he often fainted away when performing this necessary act."

DOCTOR.—"I am sorry for you my dear fellow, but it is evident that you have an incipient inflammation of the membranes of the brain, and will become either raving mad or an idiot."

PATIENT (somewhat irritated,) said, "Sir, you either compliment the present state of my intellect, or else you are a very injudicious physician. For, to an ordinary person, your opinion would be regarded as a verdict, so that your prediction would very probably in such a case become verified. But I do not think you understand my affection."

The doctor also colored up, somewhat piqued, which his new patient observed, and as they had been old friends, he thus qualified his commentary and soothed the vanity of the medical judge.

Patient.—Pray dont think my remarks were intended to be rude or discourteous; and if you will allow me more fully to explain myself, I feel you will acquit me of any such intention. If there were any organic lesion my sufferings would be constant, but now there are periods of intermission. And I have noticed that too much anxiety or application to mental pursuits, or a hearty dinner, invariably brings on an attack of greater severity than in a more normal state of my health."

The doctor expressed his sympathy and recommended the patient to travel. He did so, and yet he continued to endure these two sources of annoyance for more than two years longer, (the noise in the head and the affection of the rectum,) and he has declared since that he wondered he did not commit suicide. Nothing he said saved him but a strong religious sentiment, and the necessity of attending to his professional duties. Yet he never once attributed his sufferings from his having abstained from the use of tobacco.

At length the morbid affection of the rectum increased in intensity, and this induced him to apply to the late Mr. Alfred Jukes, of Birmingham, (a most excellent surgeon and most worthy man,) who had just published a monograph on "Diseases of the Rectum," to whom he related his symptoms. The worthy gentleman expressed his sorrow, as he personally esteemed the patient, and recommended him to take a grain of opium twice a day, and to use as an injection, an infusion of poppies.

On leaving Mr. Jukes, he says, "that he walked away quite melancholy, feeling that if he acted on this advice, he must ultimately become an opium drunkard, as he knew from experience that he would have to increase the dose from time to time. Fortunately for himself, he was a man who was in the habit of reasoning on all phenomena, and to inquire into their special causes. Therefore, when his friend ordered opium, he asked himself a few questions: If, said he, "all my sufferings have resulted from my constitution requiring a narcotic, then it is very probable that all my torture for the past years has been induced from depriving my system of the narcotizing influence of tobacco? If so, (he added as a corollary,) "I'll take a choice of evils, and resume smoking." He did so, and found some difficulty in the attempt. Fortunately for him, just about the time he was endeavoring to recommence the habit, a friend of his had sent from America, a box of very fine Havanas, for his use; yet he had some difficulty to consume a half a cigar, but he persevered, and it is now more than twenty years since, and he has never had the least return of the noise in his head, or the painful affection of the rectum, and of course continued to narcotize himself with tobacco. But he has paid the penalty of losing many teeth, without the slightest caries in the crowns, but always with the periosteum denuded from the fangs, which are as rough at their extremities, as if rasped.

He nevertheless deprecates the habit of smoking, from the latter consequence, and would never recommend any one to commence the practice. It seems certainly unwise to use any means to render the system in such an abnormal condition to require a deadly poison; but on the other hand, when the habit becomes constant, so as to assume a chronic form, then it seems very injudicious to recommend its discontinuance altogether. For if by so doing such morbid systems, as described in the case now reported for the first time do not occur, yet others may, which may also induce some form of irritability.

## ARTICLE II.

## *Veratrine and its Use in Surgical Dentistry.* By LEON F. HARVEY, M. D.

IT is our intention in this article to call the attention of the profession to a remedy, which we presume is but little known or used, and which, if a trial is made of it, will result in much benefit to their patients.

A few remarks as to its origin and its properties may be of interest.

Veratrine is a vegetable alkali, and was discovered by Pelletier and Cavinton, in the year 1819, in the seeds of the veratrum sabadilla, a plant growing in Mexican soil. It has been found in other plants, as the colchicum autumnale, &c., but is obtained mostly from the plant in question. The method of obtaining it from the seeds, we will not detail, being of but little interest to the dental practitioner. In the drug stores we find veratrine, in the form of a light brown or white powder, being entirely inodorous, soluble in alcohol and ether, but sparingly in water. It is poisonous when taken in the mouth; a burning sensation is produced, and it has an acrid taste. It produces intense salivation, and the effect of its application to the nostrils, is a violent fit of sneezing.

We have to do with its external application, and to that our remarks will be confined. Very little irritation is produced by applying it to the skin, though sometimes it blisters. The test of its purity, is a warm and tingling sensation. Until this effect is perceived, Turnbull says, no benefit will arise from the medicine.

The tincture and ointment are used, but having only used the latter, can only speak of that, but writers recommend the ointment as being the best. We were first led to use this article, by Dr. Keep, of Boston. During a visit of his, here, last summer, we had a patient who was suffering intense pain, produced by the plugging of a socket, from which profuse hemorrhage had followed the extraction of a tooth. The doctor advised the use of veratrine, applied to the jaw and cheek. The following preparation was obtained: veratria, gr. xx; glycerine, ʒi; which is the best form to use it, being much pleasanter for the mouth than the common ointment. It was applied, and gave some relief, but not as much as we had hoped for, though the pain could not be entirely removed, it being due to a plug pressed with all the force required to introduce a solid filling. There being great pressure upon the nervous filaments of the parts, medication could not be entirely successful. Determined not to discard it for this failure, it was tried on a patient who was suffering from ulcerated teeth, which she was unwilling to have removed. Here the success claimed for it, by Dr. Keep, was met, to the great joy of the patient and practitioner, for what practitioner is not happy when he has obtained a remedy which will give relief to his patient. Since then we have used it repeatedly in severe cases of ulceration, and been much pleased with the result. Where the teeth give rise to neuralgia, it very often works a cure, that is for the time being. Turnbull speaks of it very highly when used for tic douloureux. He uses veratrine, gr. x to lard, ℥i. A portion the size of a nutmeg is to be rubbed upon the seat of pain, night and morning.

The preparation we used is much stronger, and great care should be observed in its use. Upon the gum, the quantity of the size of a pin's head, can only be used, whilst upon the face, five times that amount. One effect of veratrine is to produce paralysis of the muscles, when too much is used, and, therefore, is to be carefully guarded against.

BUFFALO, *May* 17, 1860.

# ARTICLE III.

## *Loosening of Plates.*

ONE of the most singular attendants of a newly inserted plate, is that in almost all cases they become loose in about from ten to twenty days after their insertion and remain so for a short period, perhaps one week or ten days, when they again assume a permanent and useful state.

I am inclined to believe that this peculiar change occurs only in the most perfectly adapted plates, not having noticed it whilst using swaged plates, but only since my adoption of the Cheoplastic system, which gives an invariable correct fit, and finding that in all pieces, this period of partial non-adhesion always takes place at about the same time, lasting for the same length of time with a slight variation.

For a season I could hardly understand the cause which produced so sudden and so great a change. Plates would fit with the greatest perfection, and give immediate results, such results as can be realized only in this excellent mode, when in a few weeks patients would return, declaring that they were not so tight or firm as at first, equally comfortable, independent of a sense of their great liability to fall, asking the reason, which at first I found difficult to give, but latterly have at least satisfied myself upon this point, and offer my explanation to others, hoping to receive further enlightenment upon this subject from your journal.

A newly inserted plate, even in a mouth accustomed to wearing teeth, rests either upon an entire or partially new surface, always leaving some portion of the palate surface untouched. For a season the portion in contact, supports the plate satisfactorily, until from the irritation produced from the mechanical friction and pressure, the parts which have not touched the plate, swell and displace those parts which have been in contact and have supported the plate.

It may frequently happen that from the close approximation of the plate and palate surface, that at this time there may indeed be a perfect adaptation, only the mucous surface is soft and yielding, and from the irritation produced, must be followed by a condition of partial congestion of the fluid of the part, resulting in a free discharge of mucous secretion, of a sufficiently abnornal state, to be viscid and glazy, and the discharge of which must take place between the adhering surfaces, causing displacement and the introduction of air, of course attended by a loosening and increased insecurity of the plate.

At first, there must be in all plates, even in those made after this process, a nonperfect adaptation. The greater or less inaccuracy of impressions, many imperceptible changes resulting from however carefully conducted manipulations, from minute changes which doubtless takes place in the mouth, in the varying condition of health of the body affecting this part, temperature, activity of circulation, &c., &c., all producing change of volume in the mouth, giving variation at times of importance, from the condition when the impression has been taken and when the plate inserted.

The most perfect method would, by this, appear as only a comparative perfection, greatly dependent upon the skill, care or genius of the operator, *all plates requiring* more or less time to become absolutely accurate in the fit, and perfect in their usefulness. The subsidence of the mucous secretion takes place as the irritation becomes subdued by it, and is immediately followed by an induration of the membrane, with a general thickening, at the same time that all prominences are being absorbed and depressions filled up, until a very close approximation to exactitude of the two surfaces will be found. Use subsequently induces irregular absorption principally around the edge of plate, compensated for by a greater solidity of bearing upon the plate surface ; doubtless there are more or less changes going on in the mouth, through life, of the character of waste and repair.

With this process, I never hesitate to promise my patients the entire supply of their demands, but always explain the probable changes which will go on at first. So much confidence have I in it, that I boldly state that all pieces of dental mechanism can be made through it of the most perfect character and with entirely satisfactory results in the end. Not being disposed to write an encomium of the inventor or the process, I in justice state that I have continued to use it exclusively, and shall do so until something better shall be introduced. I am well satisfied it has not a rival at this time for true merit.

James.

# ARTICLE IV.

## *Practical Hints.* By A. Hill, D. D. S.

### *Expertness in Operating.*

"Slow and sure," is a sound and useful maxim, but it is not always applicable, to dental operations.

It is a great mistake to suppose, that all operations in dentistry are valuable in proportion to the time consumed in performing them. Neither is it wise, on the other hand, to hurry matters too fast. It is sometimes true, that "haste, makes waste." It is often so indeed, in our profession. It is possible to err, on either hand. In avoiding *Scylla*, let us always look out for *Charybdis*.

Perhaps, as a general remark, we might say, with much propriety, that *hasty* dental operations, are the curse of the profession. But by this, we mean *careless* operations. They are not necessarily synonymous. But if by hasty operations, we mean superficial—and imperfect, showing neglect, and want of due care and attention, then, they are to be unhesitatingly condemned. This kind of practice is not what we refer to in our caption. We only mention it, to guard the thoughtful reader, against such a suspicion.

But there is an *expertness*—a *rapidity* in operating, which we especially commend, and concerning which, we propose to offer a few suggestions. And in doing this, we shall assume, and seek to illustrate, the following proposition, viz. There are circumstances in which an operation must be done *speedily*, or *rapidly*, if it is *well* done. To be *slow* in such a case, is not to be *sure* of success, but sure of failure.

We speak now, with direct reference to the operation of stopping teeth, although the same general remarks might be appropriately made, with reference to many other operations. Other things being equal, a surgeon who can operate most expeditiously, is the one to be preferred. And we have yet to learn, the necessity of detaining a patient under our hands for the space of three or six hours, in order to accomplish the filling of an *ordinary* cavity, where a little dexterity would complete the same in one hour.

We sometimes hear of dentists spending six or eight hours over *one* filling, and the time spent in such a case is referred to as evidence of superior care and pains-taking, and as affording a guarantee of superior workmanship. This is all well, and perhaps essential, in certain cases, but such cases come not within the scope of our present observations.

There are certain essential conditions to be met in every successful case of filling. And these conditions *must* be met, or failure will inevitably ensue. We will instance some of them.

1st. The cavity must be thoroughly cleaned.

2d. The walls must be adequate to retain the filling.

3d. The cavity must be entirely dry, when the filling is put in, and as far as possible, kept dry until finished.

4th. The filling must be densely packed, and remain in this condition, so as effectually to exclude *moisture* and *air*.

5th. The surface should be left sound and smooth.

Several other points might be named, but these are the great essentials. And not one of them can be neglected with impunity.

And now the great point is, whether in certain cases, we cannot best achieve the fulfilment of all these conditions, by an expeditious rather than by a slow and moderate method of manipulation. Or indeed, whether we can fulfil them at all except by the utmost dexterity. The circumstances under which we operate are exceedingly various. Some teeth are easy of access, while others are just the reverse. Some patients are fearless and calm, while others are timid and excitable. Some have large, some have small mouths. Some jaws are finely expanded and elliptical, while others are contracted and angular. The labial muscles can be easy pressed back in some cases, while in others the effort will make one's fingers ache to hold them even in moderate traction. Some mouths are comparatively dry, while others overflow, greatly to the annoyance of the dentist. Sometimes we have a clear sky, and a fine light, (which is very essential,) while at other times it is cloudy and dark, and we see with difficulty. Sometimes we are in good working condition, while at other times we are weary and exhausted.

It therefore becomes a question of serious importance to the dentist, how he may fulfil his duty, under the varied and trying circumstances of his practice.

However desirable it is, to bring to our operations the freshness and vigor, which is so requisite to success, as well as our own comfort, it is simply impossible in a large proportion of cases.

The confinement and tension of mind and body, is often so great, as, (in a little while, through inability to maintain it,) to disqualify us for delicate and precise manipulation.

Under such circumstances, with restless patients in waiting, where a prior engagement must be met, we often drag ourselves to our painful task, with a feeling of utter physical prostration. If, on the other hand, we come to our task with freshness, and even zest, our success in some measure depends upon the patient, notwithstanding all our skill.

There are certain conditions on their part to be fulfilled, else the results at which we aim, can never be fully realized.

We will enumerate a few of them, directly bearing upon our subject.

1st. The patient must be quiet—he must hold his mouth open, and hold it still.

2d. The patient must not interfere with the operator's hands.

3d. The patient must allow the dentist to prepare the cavity in the best possible manner, &c., &c.

The conditions named above are essential to success. Yet who does not know, that in a multitude of cases, they are most vexatiously interfered with? Sometimes indeed, they may all exist, and yet only exist for a short time, and if the operation is performed at all, it must be done with the greatest dispatch.

Under such circumstances, *rapid manipulation* is the only pledge of success.

No circumstances are more trying, and none furnish a severer test of the operator's skill. Linger a little, and the mouth overflows with saliva, washing the cavity, filling and all. Linger a little, and the patient becomes restive under your hands, until, together with mental anxiety, awkwardness of position, and tension of muscles, you lose the power of precise manipulation, and your operation fails. Amid such discouragements, you retire from the patient—wipe the sweat from your brow, and either abandon the case in despair, or allow the patient to leave your office, with the painful conviction upon your own mind, that you have but poorly fulfilled your task, and have failed to render the services demanded of you.

We know of but one way to overcome difficulties of this description; and that is, *make every stroke tell and make them quick.*

Nor can we get rid of these cases. We *must* meet them. And what is more, we must do justice to them, or sink degraded in our own estimation. It will not do to pass them by, as though we did not see them. Nor recommend extraction, while a more skillful dentist might save them. We must achieve what is possible, or sink to an inferior grade in our profession. For these are just the cases, which more than others try the operator's metal. An important class of operations, must of necessity be performed for the young. And such cases, more than others, challenge our care and attention.

And their well known restlessness and excitability, absolutely forbid, in many cases, the slow and graduated movements, which in others are clearly admissable.

This class of patients present many trying circumstances. They cannot always be made to understand the importance of the necessary confinement—nor the thoroughness of the operation. Neither can they sustain the tension required in the muscles, to keep the mouth open long enough, for a protracted operation. The salivary ducts, stimulated by the sensitive dentine, pour forth a flood of water, sufficient to keep in requisition all the pumps for such cases made and provided. And if an intelligent dentist can go through with these cases, and feel that he has done his whole duty, he is most certainly deserving of a high reputation among his fellows.

And more especially, if the cavities are difficult of access, by reason of their situation in the posterior portions of the molar teeth, and there is at the same time, an unnatural contraction of the muscles of the mouth, either congenital or accidental, the real difficulties must be greatly intensified.

To us, it is perfectly clear, that what is done in such a case,

> "It were well, that it were done quickly."

We speak not with reference to the *stage* of the disease, but the *time* consumed in performing the operations. Indeed, it must be done quickly or not at all. No doubt, many cases of this sort are disposed of in a summary manner by extraction, in order to relieve the dentist of his trouble, but this method of practice can hardly satisfy an honorable ambition for distinction in the dental profession. Especially where a dentist wishes to achieve success, where success is the highest test of skill.

No fixtures, such as *lip-holders*, *tongue-holders*, *syringes*, *mouth-pumps*, *napkins*, &c., can ever compensate for lack of skill in dexterous, rapid and precise manipulation.

To fill *some* cavities, under the best combination of circumstances possible, is difficult enough in all conscience. But when, as above stated, these circumstances are against you, it requires no common energy to overcome them.

There are certain positions of body which a dentist is sometimes obliged to assume in order to accomplish his work, which it is absolutely impossible for him to sustain for any considerable length of time. And in order to complete his task, he must do it *quickly*, or fail. The muscles flag, and refuse their office, where there is long continued tension.

Many a case, deeply impressed upon the mind of the thoughtful reader, will occur to him, which will forcibly illustrate these views.

Not long since, the writer was summoned to a neighboring town, to attend to the teeth of a poor invalid young lady, who for more than ten years has been the subject of a most acute and painful illness. She was then in a state of comparative convalescence, yet a confirmed and almost helpless cripple. A violent hip disease had greatly distorted her limbs, while the cords of her neck were so contracted as to draw the head toward the right shoulder.

She had regained her health so as to be placed in a rocking chair, and yet without power to accommodate her position to the convenience of the operator.

Delicate and feeble, with scarcely ability enough to change her position at all, her head drawn down on one side, requiring a position on the part of the operator of the most tedious and awkward kind, surely such a case is sufficiently formidable.

The parents of the young lady being in affluent circumstances, were desirous to afford her every advantage which their ample means could command.

Her teeth were to be cleaned—several needed filling and two or three molars required extraction. Several cavities, were found in the posterior portions of the back grinders and one or two upon the labial surface near the gums. All presenting an array of difficulties from which any man might be supposed instinctively to shrink.

Here, both from the position of the operator, and the condition of the patient, it was needful that the work be done in the best manner and in the *shortest* possible time. And this was demanded by all the circumstances of the case.

And without any pretence on the part of the writer, that he was enabled to meet all the necessities of the case in the most perfect degree, it is suffictent to say, that this class of cases, during a practice of over twenty years, has wrought in his mind the firm conviction, that no man is competent to grapple with *such* difficulties who does not possess a good degree of skill and dexterity in dental manipulation.

## ARTICLE V.

### *The Difference in Gold Foils.*

So much has been said and written about gold foil, that perhaps it would be quite impossible to say anything new, we therefore merely offer our opinion upon the use of such foils in our hands as it has been our fortune to obtain.

Of Abbey's foil, as an even and reliable article, as far as we have tested, too much cannot be said. The lower the number of this manufacturer the better has been the working quality, being more yielding in its introduction into cavities, condensing to a more absolute solid, and, I think, welding with less pressure. Of course adapting itself better to the walls of the cavity, the most desirable quality yielding a finish equal to the best of higher numbers and deemed requiring less time and I may say less manipulative skill. Its great and most peculiar merit is its even, unchanging character, each lot being a counterpart of the previous one, and upon this has the good character of this gold been founded, and not that it is capable of doing more than the make of others will do, but because it is always alike.

With Morgan's foil his higher numbers work better than the lower. I have found Morgan's No. 10 adhesive to work quite well, indeed of all foils I ever used, a lot of his No. 10 was certainly the best, for a similar lot of which I would gladly pay two prices. But it is to be much regretted that the equality of character of this foil is not so prominent as that of the former, or else there would soon be none other used. But it has varied from the very best to the quite indifferent. In some books there will be found that soft evenness to the pressure of an instrument, adhering to surfaces of cavity without becoming inflexible, enabling one to feel an entire command over every operation he may undertake, and which can never be experienced in foil that is resisting and harsh, springing and breaking under the slightest force.

The connection between an operator and the foil he is using, can only be understood by one who for days and years has been earnestly and heartily trying to do whatever he wills with it, which enables him to detect, as it were, a vital connection between the instrument, foil, tooth and himself, so intimate as to indicate the differences and changes as belong to the very highest order of instinct acting upon matter.

Of Jones & White's foil we have not had the good fortune to use sufficient of it to pass an opinion upon it, but what we have used of it, would place it among the medium qualities, and as we write only our own experience we do not repeat many good things we have heard.

Watts & Co's adhesive sponge gold foil will occasionally produce results almost incomparable, but a fresh lot will prove useless or nearly so, as it can only be used in unseen corners, where hard things are alone bearable, and is often slippery and very obstinate, impossible to weld, and retaining its position only by opposing sides and constant pressure. We say this with much regret, for we have used of it, foil better than which never was made, and have made fillings of it as beautiful as our ability could effect, thinking that for the future our troubles were at an end, but, lamentable fact, the next lot would let us down to the other extreme.

Our own preference is for foil made in this way. It perhaps is quite as expeditious, can be absolutely pure, and its structure, when made, must be better adapted for the operation of filling than by a purely lamellated one.

When good it is used with such pleasant ease, becoming solid only when the cavity is full, and requiring the most delicate pressure, applied throughout the filling, or when a nerve is exposed it casehardens so readily over it, presenting when finished a perfectly solid and burnished surface. We believe its adhesive qualities are different and distinct from the common foils annealed, enabling it to be used in all cases alike admirably. For instance, in building a crown, sponge gold itself is not better, and for filling deep cavities it can be made as solid as a bullet, adhering closely to the walls, so much so as to appear to work itself into the very structure of the dentine, whilst annealed foil works with such increasing sluggishness or obstinacy as renders it the most uncertain and difficult at times in the hands of the best operators. Indeed if the cavity is not always shaped so as to retain the gold from the most decided enlargements within, it will frequently come out in a solid mass, without the least attachment to the tooth from adhesion, or from pressure, owing to its great tendency to weld with its own particles only.

Let Watts & Co. make an invariably good article and they would have no difficulty of supplying the best operators entirely. Abbey's foil, although not so capable as the best sponge foil, is always better in use, because it is even in its peculiar qualities, and the others vary, the operator not knowing how to rely upon them; I would like also to say Morgan's, but the former is more constant than the latter, although the latter is sometimes better than the former. We have used foil made by many other manufacturers but too little to judge of their respective merits. Merely good foil is made everywhere, but the best in our opinion is found sometimes in the manufactures of Abbey, Morgan and Watts, with the restrictions above made according to the experience and practice of

TWELVE YEARS.

## ARTICLE VI.

### *Forming Cavities in Filling Teeth.*

To form cavities in the superior front teeth, we prefer that the upper and lower extremities of the cavity should describe an angle, the central portion being formed in any possible way the disease may indicate. By this shape and by slightly under cutting, or by drilling just within the cavity at the extreme point of the angle, a filling never can come out when properly condensed.

We have been led to express the results of our experience, by having recently read a treatise upon filling teeth, in which the author erroneously advises the obliteration of all angles in a cavity, following or agreeing with Mr. Tomes' incorrect theory of the imperfect condensation of gold in the angles of cavities. Now, so far from correct is this opinion, that we assert, it would be impossible for a good operator to fill a front approximal cavity imperfectly shaped angularly. Such a shape would enable him to insert a filling of much stronger attachment than could be obtained by an oval, round or otherwise indefinite shape.

All force applied in a cavity towards the point of its angle, instead of being expended, as Mr. Tomes says, against the walls, is directly reflected along the two planes of the angle towards the point of their junction, so that this is the first part consolidated, having received necessarily, the greatest amount of pressure during the filling of the angular portion of the cavity, and when carefully done, will always be found sufficiently solid to prohibit wedging, or at least admitting less than those whose shape approaches a circle. This also secures an entire freedom from movement of the gold whilst introducing, so that we generally aim to form a more or less decided angle at that portion of the cavity destined to receive the first layers of gold, and which is made a point d'appui for the filling.

Of course every operator experiences trouble from the rolling or rocking of the gold in large round cavities, or rather, that this is one of the most troublesome difficulties to avoid, and is too often attempted by altering the shape of the gold to be introduced. This originates entirely in the round condition of the cavity, which is frequently hard to avoid, from the extent of the disease and from the extreme sensibility of the tooth preventing an operator from forming any desired shape, and thus induced to use unusual or uncommon shape of gold to overcome to a certain extent this difficulty; but this is never experienced when an angle is formed by the excavator or by the disease.

This holds equally good in the approximal surfaces of the molars and bicuspids, and when an angular shape cannot be obtained, the next best is a square one, to obviate the two great defects of a round cavity, that is rocking of the gold, and non-retention of the filling.

This position holds good whether gold is used in pellets, rolls or folds.

A good article of gold is quite capable of being forced into any shaped cavity, sealing it in a most perfect manner for a season, so that the great desideratum in shape is for the perfect retention of the filling; regarding convenience whilst introducing the gold, we believe that the more angular a cavity can be made at two opposite sides, the more certain and accurate will be the result; as to the condensation of the gold as far as shape is concerned, this is simply a matter of fact in all cavities and under all circumstances to a good operator. Of course referring only to the common and ordinary operations, such as Taft, and Tomes, describes.

We may be allowed to complain of these two writers wasting some pages in their books about the difficulties of filling such crown cavities as are much larger within than at their orifices, recommending the cutting away of sound dentine and enamel, to secure a nearly parallel condition of the walls; such advice would be good provided the disease has attacked such portions to be cut away, but in all crown fillings the true shape of the cavity is such as may be left, after entirely removing the decay and securing the retention of the filling. Gold can be readily condensed, let the cavity be whatever shape it may, which will retain the gold, for with a smooth edge and retaining form; a crown cavity may assume any shape, and it is an easy task to merely ordinary skill. To our mind, we require less information about simple cavities than is peculiarly demanded at present, for those that are only occasional, but complicated, and requiring great ingenuity, such as underlie a filling forming a base to a crown.

Although there is something unpleasant to a grave man in the labor of an art, to be interested in what has been maliciously termed "fancy operations," yet there is scarcely a week that we are not called upon to perform one or more of such operations, and not a day that we do not see opportunities of preserving teeth did we possess the ability to do so.

Since the great advocate of crystal gold has in a measure withdrawn, we have had no ideas of value sent out upon the building up of crowns upon healthy fangs, or of restoring the lost shape of teeth, and we have been astonished as well as disappointed in finding the entire absence of this topic in two recent works upon operative dentistry, the one ignoring the subject entirely, the other treating it so indifferently as to justify the foregoing assertion.

In our practice we have had at least fifteen cases within the last three months of the partial or entire rebuilding of the crowns of teeth, and we only give a mere outline of our efforts to supply this demand, as much to declare our own want of light, as to ask for some practical and useful information upon the operation.

In some cases we have used gold posts inserted into the fangs, having formed screws upon the end to be introduced, forcing them in by this means as firmly as possible. These posts or standards have been as large as the strength of the fangs would permit, their surfaces strongly barbed by a sharp chisel, to secure the attachment of the gold in packing. The principal difficulty has been in preparing the remaining portion of the tooth to be operated upon and the best manner of introducing the gold.

In all cases there will be a large portion of the natural crown remaining, of various shapes, according to progress of disease. The extending edges or surface should be filed down until healthy or strong enamel or dentine is reached, so that, if possible, all around and within the cavity a groove should be cut, here and there a hole drilled in the sound parts, as much at a right angle with the centre of the filling as can be secured, these holes being as large as strength of part will justify. This form will aid in retaining the gold, which of course must be made as solid as possible throughout, but especially at its base.

When any extent of surface will be exposed in masticating, the filling should be supported as much as possible by the parts or standards, which are easily inserted and give unquestionable strength and solidity to the whole, enabling the compact gold to retain its position against almost any legitimate force.

In a bicuspid, for instance, the post should form the inner cusp, and is most direct in these teeth, which have two fangs. But when they have but one, the standard has to slant towards the point of cusp desired, from the centre, as it were. In molar teeth, these standards are supported from any of the fangs, or from all, according to circumstance. Generally, an entire portion of the tooth will remain of one of its sides, this aiding in the support of the gold, the standards being placed so as to support all other surfaces.

My object is not to write a treatise or an article upon this subject, but to induce some practical information upon building parts, or whole crowns of teeth, about which our profession need instruction; perhaps more than upon any other.

At this day, a simple cavity is well filled by almost every dentist, a difficult one by the great mass, but to build up a lost portion of a tooth, there are but few who deserve to be spoken of.

Those puritans who started the cry "fancy operations," have no doubt retarded the progress of our imposing efforts in this direction, holding out the idea that such statements as have been made are fabulous accomplishments, and therefore have been entirely rejected by the uninitiated, when really we cannot but think, that by a little system, a good deal of labor, a little experience and devoted efforts, would have perfected the highest branch of our art. How much this same cry has tended to induce the use of amalgams, and is at this time encouraging the introduction of such compounds as will of necessity do an immense deal of mischief, it would be difficult to say, but in many instances I know of several persons who since Townsend's recommendation and others, have continued to use this paste as well as other soft ingredients, equally questionable, who were quite capable of using gold in almost any desirable manner, but have since declared that they were alone suitable for operations reforming the crowns of teeth.

## ARTICLE VII.

### *Reparation of the Face and Palate by Mechanical Means.*

By WM. H. HOOPES, D. D. S.

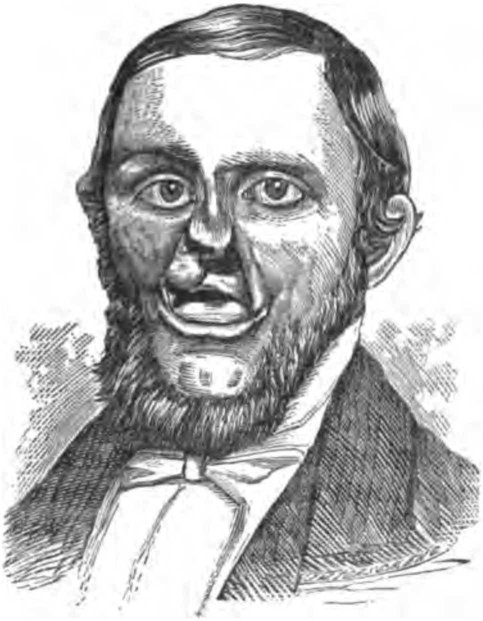
EVERY operation, whether surgical or mechanical, which aims at a restoration of the natural appearance of the human face when a part of it has been destroyed, is attended with peculiar interest. This arises from two causes. First, deformities of the face are especially disgusting to the patient and to the beholder. Secondly, surgical appliances have to be skillfully managed, or they merely call attention to the fact that such an effort has been made without success.

The case herewith reported offered but little hope of any relief on account of the extent of the deformity; but it was undertaken and with what success may be inferred from the sketches of the face copied from photographs taken before and after the apparatus was made and adapted.

The history of the case and the present state of the affected parts are as follows:

H. R—— aged 30 years, has enjoyed good health until fifteen years ago, when he contracted primary syphilis.

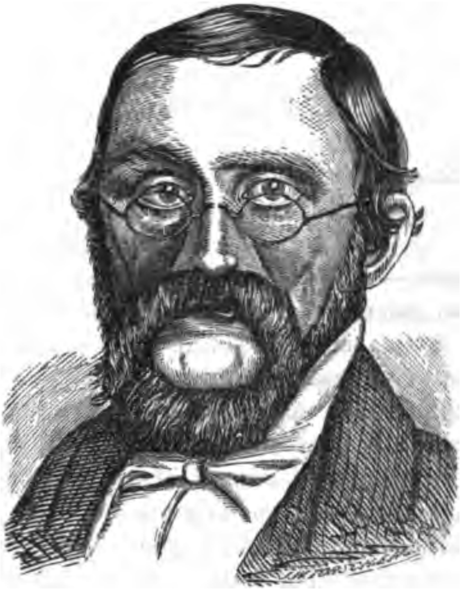
About four years afterward, the disease in a tertiary form attacked the internal surface of the nasal bone and continued to spread for some five years, when fortunately its progress was arrested, though not until it had committed the most terrible destruction of the bones and soft parts of the face.



The appearance of the face presented gives but an inadequate idea of it. It may be better understood by a description. The lower margin of the nasal bones are destroyed, with the entire vomer, the nasal cartilage and a portion of the septum. The left inferior turbinated bone is gone and a portion of that of the right side. The anterior portions of the malar bones are destroyed on the left side nearly reaching the antrum. Nearly all of the superior alveolar process is gone, leaving a mere rim, with three molar teeth on one side and two on the other; the central portion of the palatine bones is also gone, leaving an open space about the size of a half dollar piece. Of the soft parts the destruction has not been less extensive. The upper lip is destroyed, except at the angles of the mouth; ulceration had taken away much of the soft tissues of the posterior nares. The muscles of the upper lip and face that are partly destroyed are the orbicularis oris, levator labii, superioris alæque nasi, and on the left side a part of the zygomatic and levator anguli oris. It should be remembered that the sketch given reverses the side of the face.

On looking inwards and downwards, the parts presented a deep, large cavity; the motions of uvula could be seen by looking into the nose, and the tongue closed the opening through the palatine bones. Of course speech and deglutition would have been impossible, had not the patient continually kept a large piece of raw cotton in this opening. The lower lip had also begun to suffer the ravages of the fearful disease, but it was arrested at this period, and this lip presented an enlarged appearance, from the healing of a large granulated surface.

The first step in the process of making a mechanical contrivance to hide this hideous deformity, was to make a cast in plaster of the anterior portion of the face and another cast of the mouth. A gold plate was then made, fitting the roof of the mouth; upon this were inserted all the teeth that were deficient, and this plate was clasped to the remaining molar teeth. A model of an artificial nose and upper lip was then made, as near the natural form as possible. A cast of this model was filled with hard rubber, which was then vulcanized. A gold bar was attached to the inside of the artificial nose, which was made more firm by a cross bar. The opening through the palatine bones gave an opportunity to secure the nose to the plate, this was done by attaching a short tube to the plate and passing the bar through it. The plate was then placed in the mouth, the nose was attached to the face, and the bar was passed through the tube, which held it firmly in position. The stiff unnatural appearance of the upper lip was hidden by a heavy artificial moustach. The connection between



the artificial and natural noses was concealed by the bow of a pair of spectacles. The artificial nose was then given a life-like color and the illusion was complete.

Baltimore, March, 1860.

# SELECTED ARTICLES.

## ARTICLE VIII.

### *London School of Dental Surgery.*—MR. CARTWRIGHT'S *Inaugural Address.*

GENTLEMEN,—On an occasion like the present, which presents an important era in the annals of Dental Surgery, inasmuch as this is the inauguration of a new school of instruction in our special department of practice, it has been thought fitting that an introductory address should be delivered, and the honor of giving that address has been deputed to me. I acknowledge the honor, and I feel a pleasure in the task ; but I own at the same time to being possessed of misgivings lest the discourse I am about to submit to you shall not realise your anticipations. Considering the especiel nature of the occasion, I have departed from the usual character of introductory lectures ; and, instead of making this the herald of what is to come, and entering into the history of the subject of the different lectures about to be given on Dental Anatomy and Physiology, Surgery, Mechanics, and Metallurgy, I have contented myself with the endeavor to show you, who represent to a certain extent a casaul audience here to night, what the present state of Dental Surgery (and I may say Dental Politics) is, and what we trust it will be, in a few years' time, when the measures which have been lately carried out at the College of Surgeons, for encouraging the better and more uniform education of dental practitioners, have come into full play.

It is with feelings, too, of pleasure and no little pride that I find myself occupying the post of lecturer in a school formed on so sound and satisfactory a basis, and the first educational institution for dental purposes ever proposed to be established in this kingdom. When I tendered my services to the committee, I was not insensible of the responsibility I incurred ; and, occupied as my time is in the duties of private practice, I should have shrunk from undertaking the extra labor involved in carrying on the duties attached to the office I hold in the hospital and teacher in the school, had I not felt that I should be acting in opposition to my professions of interest felt in regard to this school, and the part I have taken from the first in assisting in its formation and the carrying out of the various stages of the scheme. And, again, I could not but feel that, as the son of a man who, with so much ability and credit to himself, maintained for so long the foremost rank in the profession, and by his great and universally-recognized talents and strict professional rectitude did so much towards the elevation and improvement of dental practice, I should not be doing right if I refused from personal considerations to come forward and assist with my best endeavors a work so unselfishly commenced, so zealously and judiciously carried on, in spite of obstacles and opposition, now so satisfactorily brought to a conclusion, and so cheeringly yielding a return for all the labor and trouble which has been bestowed. I cannot help feeling that I have undertaken a difficult task, and one which causes me some anxiety ; for I must be subject to the criticism of my professional brethren, to whose approbation I naturally look with solicitude ; for the possession of their good opinion I hold to be the earnest of character and position.

If we compare the state of our profession at the present time with what it was at the beginning of the present century, we must be struck with the great change which has taken place in it. Not only has the number of practitioners enormously increased, but the quality of work done, both in the surgical and mechanical departments, has generally improved in a very satisfactory degree; and where a few bright ornaments existed who upheld by their successful operations the credit of British Dental Surgery, there exist now many whose operative excellence and mechanical ingenuity are highly creditable to them as individuals, and who as a body, conduce to the elevation of English Dental practice at home and abroad. It must be remembered, too, that this general advance has taken place under circumstances of disadvantage, and without any recognized system of education. Individual labor has overcome difficulties; but the present state of perfection of operations has, with some exception, been acquired by experience gained at a time when a knowledge of the principles of such operations, and the way to perform them, ought to have been acquired before; in other words, the dentist has been *in statu populari* at the time when he ought to have been a proficient practitioner, the first years of practice being spent in learning the operative branch of his calling, and often feeling deeply his inability to do conscientious justice to those who placed themselves under his charge. Such has been the inevitable position of many who commenced practice—even those who, in other respects, were, theoretically, generally well educated and qualified by mechanical aptitude acquired in the work-room, either as articled pupils or otherwise. But there is a large class of persons in practice who can have had no possible opportunity of acquiring the knowledge which is, in this day, imperative for a professional man; and, consequently, many are driven to seek for patients through the medium of advertisements, whilst others, not possessing a particle of knowledge of the duties attached to the calling they profess to follow, are utterly lost to all sense of moral rectitude and self-respect, obtain a migratory practice by means of falsehood and exaggeration put forth with unblushing impudence.

In a profession which has existed for so long a time without governance or control of any kind, and when any one might style himself a surgeon dentist, and practice without let or hindrance, ability or qualification, discord and misunderstanding can hardly fail to arise when an effort is made to raise the standard of professional acquirement. Many will dread the idea of education; some will choose to think that the exertions of those who are endeavoring to raise their profession emanate from selfishness, and will strive to misrepresent the motives which dictated such exertions; but it must be remembered that to do a good action, and to fight in a new cause, require no small amount of patience and determination on the part of those who undertake the duty, and it is seldom that the immediate results compensate the time and trouble which have been expended. If the action, however, be really good, and the cause fought for good, sound, and noble, difficulties will be surmounted, and the struggle end in victory.

A feeling has long been prominent in the minds of the majority of intelligent practitioners, that an educational system was urgently called for, in order that the profession of the dentist should become a recognized profession; recognized by its intelligence, and commanding respect and position by the intellectual acquirements of its members. In furtherance of the fulfilment of this long-cherished desire, for some time past (upwards of four years,) a number of gentlemen have devoted much of their time and talents in originating and maturing a scheme of education which will advance the present standing of the dentist, and must prove of very essential service to the rising aspirants to dental practice. Although the circumstances connected with the details and carrying through the various stages of the scheme have necessarily entailed delay in the opening of the hospital, and especially the school, yet it is a great satisfaction to those who have so earnestly labored, and those who have shown an interest in the measures proposed, to know that the idea of a school, propounded on broad views of instruction in dental science, emanated from those who have all along been desirous to the dentists as a body recognized by, and associated with, the College of Surgeons; and though another school has been the first in the field, it must not be forgotten that the curriculum presented there, is in most respects an imitation of the scheme proposed here long ago.

But, whatever differnces may exist as to the policy of the College of Dentists in regard to the diploma, no one connected with the school, or who has a part in giving it vitality, wishes to cavil at or oppose its educational movement, since the formation of such institutions, if ably conducted, must conduce to the common weal.

Judging from the introductory remarks which have been made by different lecturers at that school, the idea of the required curriculum is in most respects identical with our own; and where a difference appears to exist, it is the result of misunderstanding or misrepresentation. It is foreign to the object of this discourse to dwell upon differences which unfortunately exist as to the proper place from whence a charter or diploma should emanate; but, regretting as I do, and I am sure all do, who have fairly considered the subject, or taken an active part in the question, the misunderstanding which is rife, I cannot avoid touching on the subject, as I deem it but just and proper that the relative views and acts of the two educational bodies should be clearly represented and understood.

The object of those who form a numerous and respectable portion of the dental profession, and who met together before the College of Dentists was conceived, was to connect, if possible, the dentists as a body with the College of Surgeons; if that scheme proved not feasible, then to create an institution and to seek a charter for themselves, which would empower them to grant diplomas in dental surgery. From these views those who were entrusted with the conduct of affairs never turned aside, never were in haste to forestall other measures by premature movements, until they were placed in a position which would enable them to carry out their schemes without having to retrace their steps. They waited patiently until the council of the College of Surgeons had well considered their memorial, and either sanctioned or refused their request. Time has proved the worth of the suggestions contained in that memorial, and the council of the College of Surgeons, after free discussion and inquiry, have secured the charter empowering them to grant special examinations for those who intend to practice as dentists; and, having approved of the curriculum which was subjected for their consideration, have chosen the examiners, who have, as you know, already commenced their duties, and about seventy gentlemen have already obtained the certificate of competency to practice. To-day we witness the first fruits of the labor of the council and members of the Odontological Society—a society which was formed as the rallying point for those who desired to be what is now so satisfactorily realized. We do not profess here to grant degrees which can be of no value; but we hope and will strive to assist in educating to the best of our abilities, and by our example, those who will in the course of time take our places, whenever hurrying time has laid his hand upon us, so as to enable them to start in life with a knowledge of their profession in all its phases, and to hold a position in the medical world, members of an educated and qualified profession.

The College of Dentists was formed, apparently, with the view of detaching the dental profession from the general profession of medicine; and in the first instance, they ignored altogether the idea of connection with the College of Surgeons. Although the ruling powers there have from time to time modified their opinions, they have now published their intention to seek a charter for themselves, (with what success remains to be seen,) and they have formed a school in which the curriculum appears to be more restricted than should be; and the position they would take is certainly not so high as they will take who seek the dental diploma granted at the College of Surgeons. And this appears to be a view in accordance with the opinion of many present and former members of that college, as in the published lists of those who have obtained the new diploma are to be seen the names of several gentlemen who either are or were recently connected with that institution.

That great service has been done for our profession by these measures (I refer to our connection with the College of Surgeons,) needs no demonstration on my part; and, although their full value cannot be experienced for some few years, yet the immediate results will be important, inasmuch as the public will appreciate the movement. And let me say that we are not too early. The measures, indeed, ought to have been carried out long ago. Although we have amongst ourselves practitioners equal in every respect to the best practitioners of any other country, still it must be acknowledged that the dental institutions of America have sent forth a great number of gentlemen who form a body of dentists of a high and uniform standard, and scattered over the world they exhibit a degree of excellence, individually, which is conclusive of the value of their practical and systematic education. All we require now is union, not schism, and a desire to do the best for our common weal, and the dental profession of England as a whole will command respect and position; to effect this we must be true to ourselves, and, by freely discussing questions of difference, and courting inquiry, trust to the sound sense of the majority of our brethren, and there will be little fear for the right views being supported. In this school it is considered essential that the dentist should be acquainted with the principles and practice of surgery, and a thorough knowledge of general anatomy and physiology; that his efficiency in these subjects should be tested by examination undergone at the highest surgical examining board—such a curriculum, indeed, as will enable the possessor of the special dental diploma to seek the membership, and eventually the scholarship of the college, if he choose to do so. There exists too much intelligence and proper pride among us to rest content with a position little short of that of the mechanist; and although it may be put forth to unreflecting minds that a superficial knowledge is all the dentist requires, with apparently some success, still it is an error of so grave a character that such a doctrine can have little root.

There have been of late several introductory discourses, which have fully treated of the history of dental surgery, and which have been published and circulated in the form of pamphlets, and in the pages of dental and medical journals: they generally take a full view of the subject, and therefore I do not deem it necessary to take up your time in reiterating what I have said to you on a former occasion at another institution, or what has been very well said on more recent occasions by others. Mr. Alexander Nasmyth's historical introduction to a work he unfortunately did not live to perfect, contains a very full and careful digest of the writings of most authors, from the earliest times to those of our own. Mr. Ibbetson's introductory lecture given lately at University College, and Mr. Grimshaw's at Queen's College, Dublin, have fully expressed as much as can or need be said on the subject; and in the British and Foreign Quarterly Review is a very good review of the works and opinions of Messrs. Huxley, Rainey, and Tomes; and I may add Magitot's Study on the Structure and Development of the Human Teeth, which contains an ample historical record of the writings of various authors.

From the earliest times Dental Surgery has been considered a part of surgery proper, and the majority of those who have written on the physiology and surgery of the teeth, in the last and preceding century, were eminent surgeons and physiologists of their time. Among the Egyptians, Greeks, and Romans, the conduct of the teeth was practiced as a specialty; in Pompeii, we know, implements have been found which were evidently used in operations on the mouth, and are, indeed, deposited in the museum at Naples. Still, the writings of the old Greek authors make it evident that dental practice was carried on in connection with general surgery. It is in recent times that dental surgery has assumed a really special branch of practice; a fact to be accounted for in the increasing necessity of the aid of the dentist, and consequently on the improved manipulative practice, which requires that more time should be devoted to the operations.

It is gratifying to mark the progress which has taken place recently in all the branches which, combined, constitute dental science. In anatomy and physiology especially, in reference to the minute structure of the teeth, and the phenomena connected with their development and growth, as well as the maxillary bones, much has been done; and it is satisfactory to find that among those who have zealously assisted to bring to light the secret handicraft of nature to unravel the laws which govern absorption and reproduction, are several members of the dental profession. The works of Blake, Fox, Bell, Robertson, Koecker, Nasmyth, and Tomes; Chaplin, Harris, Bond, Arthur, and others of America; Blanden, Serres, Oudet, De la Barre, of France, offer no mean array of professional literature. It is with especial pleasure that I refer to a work which has most recently issued from the press—the "Manual of Dental Surgery," by my colleague, Mr. Tomes; by that work and the lectures which he previously published, and papers read at the meetings of the Royal Society, he has earned a good name, and made for himself a position in his profession which entitles him to the respect of all. Although the mechanical branch of the profession has been much improved in quality of work, and greatly extended, yet no work on that subject has been published in England, as yet, on a comprehensive scale; but I hope we shall soon have such a work, embracing chemistry and metallurgy, as applied to the dentist's art, the manufacture and tempering of steel for instruments—in fact, all the subjects which can be embraced in mechanical dentistry, so that we may have a thoroughly well-got-up book of reference for that particular department. As a body the dental profession has not heretofore taken, nor does it at the present time take, a good position in the community; and it is not a difficult matter, although it may be an unsatisfactory truism which one almost shrinks from confessing, to discover a solution to the fact that dentists are, to use a common phrase, "looked down upon" in society. Up to the present time there has been, it must be confessed, a want of education among the majority—too great a tendency to carry on practice more like a trade than a profession, which naturally leads the public to look on dental practitioners in the light of mechanical handicraftsmen, rather than as professional men possessing scientifie intelligence and educational acquirements. I do not make these remarks with any intention of making invidious or ill-natured reflections. It has been generally felt that the profession does not stand as it should, and that feeling and the knowledge of the cause have urged the adoption of such measures as in time will improve the status and compel society to look with more respect upon the profession and its members. No one who practices as a dentist, and, by his sense of duty and his own regard for his *amour propre* and his calling, so conducts his practice that it may be worthy of the name of a profession, can see day after day the lists of advertisements which appear so prominently in the *Times* and other papers, without a sense of shame and feeling of strong regret; the inducements held out, and the fabulous promises made, failing as they must to realize the expectations and confidence of those who are allured by such professions, naturally bring discredit which, to a great extent, spreads its influence on the profession generally.

It has been objected, when canvassing the importance of a more general and systematic education for dentists, and a connection with the College of Surgeons, that it is useless—that the mechanical department constitutes it a trade, and as a trade it ought not to aspire to a diploma, and that it can have nothing in common with the College of Surgeons, and that special examinations may as well be issued for ophthalmic, orthopædic, or aural surgeons. There is little argument needed to show the fallacy of such reasoning. The eye, the ear, and those diseases and deformities which are commonly embraced in orthopædic surgery, are parts of surgery. The tissues and structures in health and disease are identical with all parts of the system, and the necessary operations and remedial treatment are amenable to the same laws which affect the tissues when diseased, abnormal or injured by accident, in any other part of the body. In large cities many a man of acknowledged ability and general professional acquirement is driven by force of circumstances, and in spite of his endeavors to the contrary, into special practice. There exists in the minds of the public a strong bias for consulting those who have a name as famous in particular lines of practice, and thus one man finds that he is specially consulted for the eye, another for the ear, this for the chest, and that one for the stomach, and so on, almost *ad infinitum.* Dental surgery is a specialty in the strict sense of the word: the operations necessary for the eradication or cure of the diseased structures of the teeth require nice manipulation, and a steadiness of hand, which can be gained only by systematic education of the hand and fingers; and the loss of teeth can only be supplied by the aid of mechanical ingenuity and aptitude; but the necessity for mechanical appliance does not remove dental surgery from surgery proper, more than the necessary mehanical appliances remove orthopædic surgery from general surgery. The curative treatment of surgery is in a great measure mechanical, and he makes the best surgeon who possesses, in combination with intellectual capacity, what is termed a mechanical turn of mind. The crooked lim made straight, the curved spine supported or brought again to its normal state, the cicatrices from burns absorbed by extension by mechanical means, the necessity for the knife being abandoned, are the triumphs of mechanical surgery.

That dental practitioners are a useful body of men is indisputable. The number of dentists in the United Kingdom, upwards of 1,500, show that as a community it is important. The mechanical department has nothing connected with it which is degrading, and the preliminary education of the dentist, when properly carried out, as in future it will be, is on a par with medicine or the collateral sciences. Dental science, indeed, is an occupation which gives to the mind taste and feeling for the art generally. An artist's eye, hand, and mind is a necessity indeed ; for perfection of workmanship is the aim of the honest practitioner, and besides the securing the comfort of the patient, the expression and character of the mouth must be studied when the dentist is called upon to supply the ravages which time or disease has made. It cannot be maintained with success that a knowledge of medicine is unnecessary, or that a knowledge of anatomy and physiology is not required. Local and remote pains exist, which may either arise from the teeth, or may have origin in disordered conditions of remote organs and deranged functions. Clenching or grinding of the jaws in sleep or otherwise may be the result of cerebral or spinal irritation, as likewise diseases of the chylo-poetic viscera and hemorrhoidal condition of the rectum, whereby is induced, indirectly, considerable tenderness of the teeth and sockets together with irritation or inflammation of the gums. An irritable condition of the mucous membrane lining the stomach may, when excited by undigested food or flatus, cause neuralgic pains of great intensity, passing up the œsophagus and extending along the course of the throat, palate, soft and hard, and dental nerves of the superior but most commonly of the inferior maxilla. Or a tooth, apparently without sensation, may be the cause of pain or tenderness in the region of the articulation of the jaw, wandering, sharp, darting pains in the face, head, temples, or neck, or severe pain in the eye, ear, limbs, or hip, and diseases or the periodical excitement of certain organs, the uterus more particularly, may sympathetically excite pain in the teeth.

Unfortunately for humanity, the teeth appear to be a portion of our frame peculiarly liable to premature decay. Considering their importance in the economy, it seems strange that they should be so deficient in those qualities the perfection of which is essential to the health and comfort of individuals; in fact, it appears that of all parts of our system the teeth are the least adapted for the office they have to fulfil; or to take a superficial view of the question, one would be inclined to attribute a departure from the harmonious action so constantly recognisable in the laws which regulate our frame, and balance so nicely the phenomena of life and health. Whatever the cause be which entails frequent disease and loss of the organs of mastication (and it will be my province hereafter to inquire into the causes of such failure,) their prominent importance as the mechanism whereby the animal and vegetable substances taken to supply nutrition, and the diseases and discomfort which ensue when that mechanism is defective or destroyed, give value to the aid of the dentist, and prove that it is essentially conducive to the health of mankind. By the formation of the dental hospital a class of persons who suffer greatly, but who have not the means to command professional aid, have the opportunity afforded them of being relieved; and this school of instruction in all the branches which are comprised in dental surgery will teach aspirants to that science how to effect all the good that can be done for the relief of suffering, as regards especially the mouth. One great result will be gained by the establishment of these institutions, inasmuch as together they will be the means of obtaining important and valuable statistical facts which may go far to throw light on much that is obscure as relates to the cause of diseases, and the phenomena of many of the affections exhibited in the structure or development of the teeth. In the treatment of disease there is much that is empirical; and here again the system of treatment may become more generalised and systematic. It is by recording facts as they occur that truly valuable facts can be obtained, and hence the importance of keeping careful records of all that is done in the operating room of the hospital. I cannot impress too strongly on the minds of you who are present here to-day as pupils the after value which you will attach to notes of cases systematically registered. On comparing your impression of the results of practice, whether in reference to numbers or cases, you will be surprised, on referring to your notes or tables, to find how erroneous has your mental impression been.

There are points in practice at the present time which are at variance with the experience of older practitioners. These institutions will be the means of elucidating the value of particular lines of practice, and testing the motives which have urged them into prominence. Truthfulness is the basis of all scientific research, and should ever be the household god of the professional man. It requires caution as to the reception of new doctrines, and we must carefully discriminate between a theory hastily promulgated from interested motives, and a fact put forward on philosophic grounds, or one emanating in scientific honesty. If long experience prove that in jaws which are abnormally small a crowded set of teeth may be prevented or remedied by the timely removal of certain teeth, and an individual states that removing teeth under such circumstances is altogether unnecessary, and that the crowded teeth should be forcibly drawn or forced into a circle, truth must rest on the side of one of the modes of practice only; or if dead and painful teeth are retained in the mouth, on the principle that it is bad practice to remove teeth, whilst experience proves that teeth in such conditions are useless members, and worse than useless, inasmuch as they interfere with free mastication, the value of the practice which forbids the removal of such teeth must be substantiated before the practice which has been sanctioned by experience is laid aside. Points of practice, then, such as these, will be tested by results based on extended information conveyed by analyses of facts, and a beneficial influence will be exerted on operative dental surgery.

It has been asserted that in practice dental surgery is gone back, and that bad teeth and alveolar abscess are much more common than was formerly the case, and that the prevalent bad condition of the teeth and gums is owing to the use of amalgam filling. I must say that, as far as my experience goes, the inference is adduced from narrow channels, and I am quite certain of this fact, that amalgam fillings do not give rise to alveolar irritation *per se* Doubtless the endeavor to preserve teeth is now-a-days greater than it was in years gone by; and constantly amalgams are used for convenience, and in cases of extensive decay, for comparative plainlessness and safety as regards fracture of the thin walls of the cavity. Were gold used in all such cases, the result would be the same as regards subsequent alveolar irritation in a certain number of the cases treated. In former years, numerous teeth which are now more or less successfully plugged would have been extracted, and hence arises the fact—if it be a fact—of the greater prevalence of such conditions. But here again it behooves us to look closely into assertions, and convince ourselves of their value. We must consider the number of dentists who exist now as compared to former years, the number in whose practice such chronic disease exists after teeth are filled in but few exceptional cases, and who as practitioners equal, if they do not excel, those who practiced at the beginning of the century; and we must not forget the number who really know but little concerning the treatment of teeth, and whose ideas of filling cavities are limited.

A prominent feature of the present day, and one comparatively of recent date, is the craving for painless operations. Teeth are now expected to be removed without the sensation which normally accompanies the operation; and the various stages even of filling cavities in teeth are to be gone through without disturbing the nervous sensibility of the patient. The operator who applies the force necessary to consolidate a sheet or more of gold leaf into a solid plug is not unfrequently taxed with being extremely rough. In order to overcome the repugnance or inability of the present race to bear even a moderate degree of pain, agents are used which deaden sensibility or produce anæsthesia; freezing mixtures and electricity effecting, or being supposed to effect, the one, and chloroform, and we hear of mesmerism—hypnotism more recently—producing the latter. These several agents have, or have had, each their supporters and admirers, and appear to have been successful in various degrees.

Imbued as society is now with the notion that pain is next to unnecessary, efficient operations are rendered more difficult and troublesome, and often become extremely irksome to perform; unsatisfactory results consequently ensue from the frequent complaining and impatience of the patient, and the sometimes yielding of the better judgment of the operator.

It is the province of this hospital and school to test and record the effects of agents now commonly in use for deadening sensibility or mitigating pain, so that the profession at large may have reliable data to go upon as regards their capability really to effect what is reported of them.

It is natural enough that the public should expect from practitioners the utmost assistance that can be given, and if certain agents will ensure them from suffering they will seek such aid where they can find it; and it behooves all practitioners to satisfy themselves as to the value of any new agent which may from time to time be introduced. It is, however, equally incumbent upon them sternly to avoid pandering to weakness and folly. If they be reasonably satisfied that any particular line of practice is empirical, no consideration of temporary credit or gain should induce them to have recourse to it. It is the duty of all to be very careful of maintaining a strict professional moral code. There are numbers of unthinking people who may be deceived by self-praise, or easily misled by the profession of superior excellence, however offensively paraded, or may be deceived by an unworthy criticism or unjust remark passed upon the work or ability of a brother professional. But there are many also who are not to be caught by such discreditable conduct, and who form their own just estimate of the individual who adopts such means of winning patients. Let there be honorable competition among professional men. He who attains and maintains a high position by his own labor and ability, need be no object of envy and jealousy. His example should rather be to others the stimulus to exertion, his successful career deemed worthy of applause and imitation.

There is a feature effecting the present state of dental practice which demands a special notice on an occasion like the present; and that is the passing away of certain classes of disease, and certain lines of practice, from the province of the dentist into the hands of surgeons and physicians—a change in some respects natural, in others not altogether to the advantage of the public. As a general rule, those affections which depend upon causes and conditions which constantly present themselves to the notice and consideration of special classes of practitioners are more likely to be recognized and treated effectually, particularly when the specialty is so marked as it is in the branch of dental surgery. Some years ago, my father had many cases of antrum affections, mostly connected with diseased teeth, under his care; and it was the habit of that time, now some years back, for patients to bring infants to him for the sake of advice or operation during the period of dentition. But for years past the antrum cases and the babies had ceased to come under his notice, and this is the case with many affections of less importance. I cannot help thinking that dentists have to thank themselves for this partial cession of practice; for I know of instances where an opinion has been sought of the surgeon, when it was the province and duty of the dental practitioner to have acted on his own responsibility. The tendency to call in aid in comparatively simple cases is to lower the position of the dentists as a body, and to shake the confidence of the public in the estimate of their capabilities. When there is indication of disease of the maxillary bones, although such disease may be correctly diagnosed, there can be little doubt that the surgeon, from his greater experience in such cases, is the proper person to consult: but in all cases of irritative disease, caused positively or indirectly by teeth or the roots of teeth, the dentist ought to treat himself. The line between such irritative symptoms, and the appearance and conditions which present themselves to the eye and touch in malignant growths or osseous enlargements, are so marked that there is little difficulty in determining the one from the other even in the early stages. I am sure that I may say, without fear of contradiction, that cases of diseased bone or malignant growths of the investing tissues or the gums are very seldom found to have their origin in the teeth. It is true that we occasionally meet with abnormal over-development of teeth giving every appearance of diseased bone; and we not unfrequently see cases of large osseous cists connected often with the capsule of teeth, and sometimes existing *per se*. And rarely we have cases under our care of necrosis of the sockets of the teeth, the roots of which have been dead and diseased for a long while.

But time warns me that I may be taxing your listening powers and your patience beyond fair limits: as it is, I have reason to thank you for the kind attention you have bestowed during the hour devoted by custom to these preliminary emanations. In conclusion, I will urge those who are present here as pupils to continue your attendance at the hospital with the same regularity, and carry on the duties with the same zeal, which has hitherto marked the commencement of your career here. Your punctual attendance, and the evident desire to do well, evince on your parts appreciation of the opportunities afforded you of acquiring a practical knowledge of your profession. Believe me, you will find out their value when you enter into professional life; you will start at a point, to arrive at which even those who have immediately gone before you must go through an anxious time of self-taught experience.

I earnestly counsel you to look upon the calling you have selected as a profession, and to sternly uphold it as such. Make yourself acquainted with the collateral branches of science, and with general literature; thus you will gain capacity and refinement of mind which will entitle you truly to practice as, and to hold rank with, professional men, and you will add your weight in the scale to sink the folly of those who deem it politic to lower the position of the dentist, and to make him a nonentity in the professional and social scale. You will help also to shame those practitioners in medicine and surgery who appear to be so easily alarmed lest their province should be invaded by the improved education of the dentist, and who have subscribed to most illiberal and unfounded notions put forth with regard to the dental diploma issued from the College of Surgeons.

Those who, whether members of the College of Surgeons or not, devote their time and energies to the special treatment of the teeth, and the diseases consequent on their depraved condition, are not likely to practice as surgeons or medical practitioners; but they know from experience that the practice of dentistry, special as it may be, cannot be carried on with credit or efficiency without a knowledge of the principles of surgery, and an intimate acquaintance with anatomy and physiology.—*London Dental Review.*

# ARTICLE IX.

## *Mr. Hulme's Lectures on the Structure and Development of the Teeth.*

### SECOND LECTURE.

In the common skate, the jaws are covered with successive rows of minute teeth: if the finger is passed over these teeth in the direction of the throat, they feel as smooth as a piece of polished marble; but on attempting to withdraw the finger, it comes in contact with a sharp spine, which forms the posterior edge of every tooth which covers the jaws: these spines successively come in contact with whatever is attempted to be withdrawn from the mouth, and in the living animal forms an effectual barrier against the escape of its luckless prey. In the cestracion philippi, or Port Jackson shark, the jaws are provided both with pointed teeth and crushing teeth: those at the anterior part of the mouth resemble the teeth of the common skate, only they are larger and of a more formidable character, while those at the sides are convex oval teeth adapted for crushing.

One of the most extraordinary forms of dental structure is that which occurs in the pristis or saw-fish. This creature is an active and predatory shark; but the teeth which cover the jaws are extremely minute, and invest them in the same manner as the tesselated teeth of the rays. Such a dental armature would be of little assistance to it in its predatory habits. To compensate, therefore, for this feeble development of the jaw-teeth, the animal is provided with a long projecting rostrum in front of its head, which is armed on either side with a formidable row of powerful projecting spines or teeth. This rostrum is a horizontal flattened plate, which is produced to a length equalling one-third that of the entire fish. This process is more completely ossified than any other part of the skeleton, and a series of deep sockets is excavated in each of its lateral margins.

The teeth which are lodged in these sockets are elongated and compressed in the same plane as that of the body of the rostrum, and their edges converge to a sharp point. The walls of the sockets are sufficiently ossified to give the teeth a firm attachment; but as all unnecessacy weight must be especially avoided at the fore part of the animal, the spaces between the sockets and all the central part of the rostrum are filled by a gelatinous medulla, and hence the whole apparatus has nothing like the weight that its size would indicate. Thus armed, the saw-fish does not fear to encounter the largest of the cetacea, upon whom they often inflict the most serious injuries. These fish frequently attain a length of from twelve to fifteen feet.

*Structure.*—In none of the sharks or rays are the teeth ever composed of only a single kind of bone; at least two enter into their formation, more generally three, and occasionally as many as four. The outer surface of the tooth is covered with a white shining layer of hard dentine, which is commonly spoken of as enamel, but which is very different in its structure from that modification of osseous tissue which forms the enamel of the mammalian tooth. It is simply a more compact kind of dentine, in which the tubes are much finer than those which form the central mass of the tooth, and in which there is a much larger amount of calcareous cells.

The central dentine is made up of course dendritic branches, which subdivide and ramify in every possible manner. At the summit of the tooth the tubes run in an upward direction: on the sides, transversely towards the external surface; and nearer the root they radiate in a downward direction. The proper trunks of the tubes lie at a tolerable distance from each other, and their divisions, which usually commence very near the origin of the main tubes, recede considerably from each other. Branches of the pulp frequently penetrate between the dentinal tubes, and give origin to other systems of tubes which are dispersed in the interspaces of the principal branches. The inner and outer masses of dentine are separated from each other by an intermediate layer, in which a number of minute lacunæ are present, which possibly transmit the nutrient fluid from the one to the other. The central cavity, which is at first occupied by the pulp, becomes gradually filled with a coarse kind of osseous tissue, which partakes of the characters of dentine and bone. Lastly, towards the base of the tooth there is frequently a true osseous structure, which closely resembles the bone which forms the skeleton of the osseous fishes.

The broad pavement-like teeth of the eagle rays have a very peculiar and beautiful structure; when a longitudinal section is examined, a number of pulp processes are seen passing from the base towards the summit of the tooth, but terminating either abruptly or by turning back, and so forming a loop before it reaches the enamel-like layer which coats the working surface of the tooth. These pulp processes are each surrounded by its proper system of dentinal canals, which subdivide and branch in the manner that has been already described in other teeth. Each pulp process, with its system of branching tubes, is separated from the neighboring systems by a series of lacunæ with radiating canaliculi; so that they might be compared to a number of simple teeth which had become united together to form a large compound tooth. The boundary lines or systems of intervening lacunæ are best shown in a transverse section: in such a specimen, each pulp process is cut across, and is seen as a round central spot, with the dentinal tubes radiating from it; where these terminate in their ultimate branches, they are surrounded by the lacunæ.

The last division of the fishes, consisting of the ganoidea, are distinguished from all that have been previously noticed, by possessing an entire or partial covering of scales, whose outer surface has a shining enamel-like appearance;

it was this character which has procured for them their name, from the Greek word *ganos*, signifying splendor.

Little need be said of this division, further than to mention that one of the existing species, the sturgeon, offers an example of an edentulous fish; while in another and similarly edentulous species, the spatularidæ, the surface of the jaw is curiously expanded, resembling the beak of the spoonbill, and is more than half the length of the body. It would, however, be far otherwise if the history of the fossil species had to be entered upon. These fish were amongst the most ancient inhabitants of the oceans of our globe; they abounded in the earliest geological strata, and up to the period when the deposit of chalk took place: from that period they began to diminish, and are now represented by only a few existing genera. The most characteristic living example is the lepidosteus, or bony pike, which inhabits the rivers and lakes of America. Many of these fossil fishes are only known by portions of the jaws, and of the teeth which were attached to them. It is not at all times an easy matter to decide whether such remains belong to the class of fishes or of reptiles. The following is a remarkable and interesting example of this kind, and will serve to show the value which frequently attaches to the microscopic character of fossil teeth; although, in the instance adduced, it did not at first lead to a correct determination of the anatomical relations of the individual to which they had belonged.

"In the year 1830, Count Munster obtained specimens of the upper jaw, palate, and teeth of a vertebrate fossil from Bayreuth in Bavaria, referring them to a class of fishes. Agassiz, in his great work on fossil fishes, accepted Count Munster's determination of the nature of these fossils; he referred them to the ganoid order of fishes, and established a special genus for their reception, which he named *placodus*, a term indicative of the broad, flat teeth of these supposed fishes. The matter remained in this state until the year 1857, when some better preserved fossils from the same locality were brought to the British Museum, and came under the notice of Professor Owen. These remains showed that they belonged to an air-breathing class of vertebrate animals. Agassiz, who had examined the teeth in the specimens first found beneath the microscope, stated that the microscopic structure of these teeth was the same as that of the other genera of ganoid fishes, and observed that he believed he was not mistaken in referring them to the family of pycnodonts."

How this accurate and experienced naturalist fell into such an error, it is impossible to say; but when Professor Owen submitted sections of the teeth to the same test, he found that they conformed to the ordinary crocodilian and lacertian type. The dentine is of the hard or unvascular kind, and the crown of the tooth is covered by a moderately thick well defined layer of true enamel. This enamel in the newly formed tooth presents numerous close set, fine, irregular striæ or rugæ, radiating from a central groove or pit on the summit; the teeth are subject to the same succession and displacement as in the reptilia generally.

The dentine presents, under an adequate magnifying power, extremely fine, numerous, and close set dentinal tubuli, without admixture of medullary canals; they radiate from the wide and shallow pulp cavita, with a corresponding feeble divergence at right angles to the outer surface of the tooth. The tubuli are at first straight, but show two slight primary bends near the periphery of the tooth. They present a diameter of $\frac{1}{28000}$ of an inch, with interspaces varying between two and three times that diameter; they divide once or twice in their course: a few secondary branches were discernible near the periphery of the dentine. The difference between their dentinal structure and that of true pycnodont fishes is seen in the larger relative size and much closer arrangement of the dentinal tubuli in those fishes. The terminal branches into which the tubuli resolve themselves, penetrate, in pycnodonts, the clear substance which is analogous to enamel, but is a continuation and slight modification of the intertubular or basement tissue of the entire tooth. In placodus, the layer of enamel is as distinct as in the monitor or crocodile. It is a very dense or compact substance, in which a structure of fibres, vertical to the substance, is but faintly discernible near the dentine.*

The next teeth which were noticed were those of the amphibia. This division of the vertebrata is represented in this country by the common toad and frog. The first of these animals is edentulous; the latter is provided with teeth, but they are exceedingly minute and confined to the upper jaw. The food of the frog consists of various kinds of insects, the common slug, and other small animals. The mode in which the creature secures its food is exceedingly curious. The tongue has a reversed position to what it has in other animals: instead of being attached to the top of the throat, it is fixed to the inner surface of the anterior part of the lower jaw, while its free extremity is directed backwards and lies along the floor of the mouth. The apex of the tongue is covered with a glutinous secretion. When an insect comes within reach of the frog, the tongue is suddenly everted from the mouth, the insect adheres to the glutinous secretion, and the tongue is immediately returned to its ordinary position; the throat of the animal is seen to move as in the act of swallowing, and, at the same time the prey is passed directly into the stomach. The whole operation is so rapidly and instantaneously accomplished, that, when narrowly watching the movements of the creature, all the spectator can detect is the sudden convulsive movement of the frog, and the disappearance of the insect. The toad also secures its food in the same manner.

The teeth of the existing batrachians are all of them small, and with but little in their structure that calls for remark, with the exception of the presence of a layer of true enamel on the crown of the tooth. There have, however, been found the remains of animals which were allied to the batrachia, in which some of the teeth were no less than three inches in length, marked on their outer surface by longitudinal grooves, and exhibiting the most complicated arrangement of the dental tissues which has hitherto been met with throughout the animal kingdom. It was on account of this complication that they received the name of labyrinthodons. These teeth were first described by Professor Owen, in the 'Proceedings of the Geological Society' for 1841, and subsequently in his 'Odontography.' The extinct labyrinthodon had its teeth implanted in distinct sockets. They consisted of a close-set series of subequal teeth placed along the margins of the upper and lower jaws, and along the anterior part of the outer margin of each broad vomerine bone; two or three canine-shaped teeth, three times the size of the others, were placed in the intermaxillary bones at the anterior and external angle of each vomer, at the fore part of both the outer and inner rows of the smaller teeth in the upper jaw; and two or three similar teeth were implanted somewhat irregularly behind the anterior extremity of the series of smaller in each ramus of the lower jaw.

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* Phil. Trans. 1858, p. 177.

The first discovered of these fossils were some detached teeth from the Keuper sandstone of Wirtemberg, which were taken for the remains of a gigantic saurian or lizard like reptile. More perfect remains of this kind were afterwards found in the new red sandstone in Warwickshire, in this country, and showed that the extinct animal was more nearly allied to the batrachian than the saurian order of reptiles. In the course of these investigations, a question arose as to what division of the new red sandstone, as developed in Germany, corresponded to the light colored sandstone of Warwick? It has already been shown in the present lecture, that the structure of a tooth is in some cases sufficient to decide as to the icthyic or reptilian nature of the individual to which it belonged. In the present instance, the microscopic structure answered another purpose, viz. that of showing that these widely separated geological strata were equivalent to each other. The remains which were in the possession of the geologist were not sufficiently distinctive to decide the question. Specimens of the teeth were, therefore, procured from each locality, and submitted to microscopic examination, when the peculiarities of structure so perfectly corresponded, that there could be no hesitation in deciding that the strata in which these fossils had been found were identical. Having procured one of the Warwickshire teeth, says Professor Owen, a section was taken from the middle of it, corresponding with the place of section of another preparation from one of the German specimens, and both were examined by the microscope. "The complication of the interblended laminæ of dentine and cement is as remarkable, and its place is the same as in the tooth of the great labyrinthodon of the German Keuper. All the peculiarities, indeed, of this most extraordinary type of dental structure are so closely preserved in the specimen from the Warwick sandstone, that generic identity at least may be predicated of the fossils from both localities."

In the typical serpents, as the boa constrictor and others, the teeth are placed upon the intermaxillary, maxillary, palatine, and pterygoid bones in the upper jaw, where they form two longitudinal rows on either side, while in the lower jaw they form a single row placed along its margins. All these teeth are of a conical pointed form; those of the upper jaw having their points directed downwards and backwards, and those of the lower upwards and backwards. The bones to which the teeth are attached are connected together by elastic ligaments, which allows them to be widely separated from each other, and enables the creatures to swallow animals of much larger dimensions than themselves. In the poisonous serpents, the teeth attached to the maxillary bones are reduced in number. It is the anterior of these teeth which constitute the poison fang. Each fang is traversed by a canal commencing at the root of the tooth, and terminating in an oblong slit at the anterior surface of the apex: it is, in fact, a hollow cylindrical tooth, formed by the pulp being bent into the form of a cylinder, and then becoming invested, in the usual manner, by a coating of dentine and enamel; only the interior of the cylinder is left hollow, to constitute the duct which conveys the poison from the gland into the wound inflicted by the tooth. In all the serpents there is a constant succession of teeth throughout the life of the animal.

A very curious and interesting modification of the teeth occurs in a small species of snake, the *coluber scaber* of Linnæus, which inhabits the trees of Southern Africa. It is the duty of this species of serpents to prevent the undue increase of the smaller birds by devouring their eggs. If the teeth had been of the ordinary size, the eggs would have been broken as soon as they entered the mouth, and their contents would have been liable to have escaped: they are, therefore, exceedingly small, and are soon lost, so that this serpent has even been described as being edentulous. In consequence of the minute size of the teeth, the eggs pass along in an unbroken state; and it is not until they have entered the throat, and the mouth has become closed so as to prevent the escape of any of the nutritious matter, that the egg becomes exposed to instruments adapted for its perforation. These instruments consist of seven or eight of the inferior spinous processes of the cervical vertebræ, the extremities of which are covered by a coating of cement, and penetrate the soft structures of the throat. The points of their spines are directed backwards, and break open the eggs as they pass along in their way to the stomach.

In the crocodilia, the teeth are confined to the superior and inferior maxillary bones; they are reduced in number, and certain of them now begin to maintain definite relations to the other teeth and to the parts of the mouth, so that the genera belonging to this division of the reptilia are best characterized by the modifications of the dental system. Thus, in the crocodiles, the first toóth in the lower jaw perforates the palatal process of the pre-maxillary bone when the mouth is closed; the fourth tooth in the lower jaw is received into a *notch* excavated in the side of the alveolar border of the upper jaw, and is *visible externally* when the mouth is closed. In the alligators, on the contrary, it is received into a *cavity* of the palatal surface of the upper jaw, where it is *concealed* when the mouth is closed.

In the gavials, the teeth are nearly equal in size and similar in form in both jaws, and the *first* as well as the *fourth* tooth in the lower jaw passes into a groove in the margin of the upper jaw when the mouth is closed (Art. Teeth, Ency. Anat., p. 895.) Not only are the teeth reduced in numbers and confined to the margins of the jaws, but they now begin to be provided with distinct sockets for their reception. In the black alligator, of Guinea, the anterior teeth of the lower jaw are received into distinct sockets, while those at the posterior part are contained in an open groove.

When examined beneath the microscope, the reptilian are seen to consist of an exceedingly compact dentine, the the tubes being very small, and not separated by intervals greater than two or three times the diameter of the tubes. The trunks of the tubes divide distinctly immediately after their commencement at the internal cavity, the branches of the divisions curve immediately away from each other, and numerous minute branches of various lengths are given off on all sides, of which, however, most seem to turn towards the root. These ramusculi seem in many places to terminate with dilated extremities in osseous cells. Numerous layers of osseous cells are found in the whole length of the tooth (Retzius.) The crown of the teeth is covered with a layer of transparent enamel, and the fang is invested with a coating of *crusta petrosa*. Retzius first remarked that all the branches in the crown of the tooth run towards the periphery, and in the remaining part they are given off by that side of the main tubes which is nearest the root. These branches pass off almost parallel to each other, and at very acute angles. They also give off numerous branches, which are, likewise, nearly parallel with the others. This parallelism gives to the dental bone of the python, when seen through the microscope, a very peculiar appearance.

## ARTICLE X.

*Anæsthesia and Anæsthetics.* By EDWARD R. SQUIBB, M. D., of Brooklyn, N. Y.

THE condition of insensibility to pain belongs exclusively to the brain proper, or to that part of the nervous system which provides for sensation and voluntary motion; and is effected when not the result of mechanical injury, invariably through the agency of the circulation. It therefore follows upon this, and upon the circumstance that the nervous centres of organic life exercise no primary function of ordinary sensation or voluntary motion, that the special agents resorted to for anæsthetic purposes should not only be directed especially to the sensorium, but should be diverted as far as practicable from the remaining portions of the nervous system, in effect. But, the circulation carries the anæsthetic agent everywhere, and with the elements of vitality and molecular reproduction must convey and distribute this powerful agency also; and hence the special agent for effecting anæsthesia should not only act directly, promptly, and transiently upon the sensorium, but should be, as far as possible at least, innoxious elsewhere. In short, it should suspend the functions of the sensorium without liability to interference with any other organ or function.

Such an anæsthetic effect is produced perhaps in the greatest degree of perfection by a certain amount of concussion of the brain, which sometimes results from accidental violence; and the effect is most perfect here, because it is produced directly upon the brain without any contamination of the circulation with foreign influences; and the circulation thus left free for the performance of its normal functions not only preserves the organic life intact during the temporary abstraction of the presiding sensorial functions, but through its reparative agency quickly remedies the shock, and restores the brain to its normal condition.

The next most perfect anæsthetic effect is that to which a small proportion of persons are susceptible, wherein the sensibility to ordinary impressions of pain or injury is suspended or overpowered through concentric nervous effect. Whenever the balance of nervous power is so disturbed as to reverse the current of the nervous batteries (so to speak,) as in the so-called mesmeric condition of certain persons of feeble nervous tone or energy; and in the high degree of nervous excitement to which others are liable through agencies that act altogether from without, the æsthetic functions of the sensorium are altogether suspended, as in catalepsy, or are so impaired that serious injuries are unconsciously received.

The effect, however, in both these classes of cases can never be utilized if from no other cause than because it is independent of the circulation, and all other practical means of production, maintenance, and control. The circulation therefore becomes indispensable as the means of introducing the anæsthetic agent, and of controlling its effect; and the collateral circumstance that the circulation must inevitably carry the agent to parts where it is not desired, and where it may become noxious, must be taken as a drawback, and a most important indication in both the selection and management of the anæsthetic to be used.

From these circumstances, and inductions taken as points of departure, it is not difficult to deduce the indications in the use of anæsthetics as being, first to suspend sensation and voluntary motion; and, secondly, to do this with the least possible interference with the functions of organic life. These points admitted, and kept prominently in view, will, with a little reasoning, render the management of anæsthetic agents very simple, and will make the accidents and mismanagements more intelligible and more easily avoided.

These accidents are, first in importance as well as in frequency perhaps, some form or degree of asphyxia. All the vapors used for anæsthetic purposes are irrespirable. That is, they do not contain oxygen in a condition in which it is available in the lungs for renewal of the blood. Just in proportion, therefore, as the vapor is introduced is the normal quantity of air diminished, and the proper oxydation of the blood prevented; and the ratio of this proportion is as inevitable in the effect upon the powers of life as it would be if carbonic acid or water, or any other irrespirable medium was substituted even up to that proportion which produces spasmodic closure of the glottis. It has been not unfrequently noticed, in what the writer believes to be the mismanagement of both the common anæsthetics, that the administration has commenced with a proportion of the vapor so large as to produce this spasmodic closure of the glottis. Under such circumstances, if it was possible to keep up such a proportion throughout the struggling of the patient, the spasmodic closure would doubtless be as persistent as it is in drowning. But when from withdrawing the sponge a little, or from the displacement of it in struggling, the proportion of air is increased, the glottis is relaxed again, and the imperfect respiration goes on quickly to a point when, from the undue, sudden and depressing effect of the anæsthetic on the nervous centres, the glottis no longer responds to the action of the irritant, and the vapor passes freely into the lungs, no matter how strong or how small the proportion of air mixed with it. The pulse and respiration then give the indications to suspend and reapply the anæsthetic, and it becomes a matter of time, endurance, and of management as to how far the powers of life are taxed.

It is, therefore, not a question as to whether aeration of the blood is to be interfered with at all, or not, since some portion of anæsthetic vapor is indispensable, and since that portion must exclude a corresponding portion of the air; but the question is rather, how far the due aeration of the blood may be judiciously and safely interfered with;—or in other words, what degree of asphyxia is justifiable and proper in the management of anæsthetics; and the natural conclusion is as practical as it is logical, namely, that the least possible degree is safest and best, and that the interference should not be hurriedly induced, or maintained a moment longer than is absolutely necessary.

If suspended animation from the circulation of venous blood in the brain was to be resorted to for anæsthesia, it would be necessary to immerse the patient at intervals in water, carbonic acid, or other irrespirable medium, in order to maintain the condition; and the risk of fatal asphyxia would be here much more apparent, though really not very much more imminent than in the nearly parallel case wherein the irrespirable vapor of ether is substituted throughout a clinical lecture, with the antagonistic stimulant effect of the operation postponed till near the end of a long period of insensibility. The position that the insensibility in *ordinary* anæsthesia is due to the circulation of unrenewed blood in the brain is, however, only true in part at the utmost, and this introduces another of the accidents that may occur in the management of anæsthetics.

If it were possible to separate the true desirable anæsthetic effect from every vestige of asphyxia on the one hand, and from all direct interference with the functions of organic life on the other, it would probably be found to consist in a simple specific paralysis of the nervous ganglia of sensation; and the desirable degree of such effect would be that which did not at all overreach the object. By overreaching the object however, whether it be by a too profuse, or a too prolonged use of the agent, the result must be injurious, since suspended function is but one step in the catenation which leads to disorganization and death, and that step once passed, the others may be accomplished insidiously. Such an hypothetical position is, however, only assumed to show that there must be a condition of hyperanæsthesia, or excessive anæsthetic effect,—that such a condition is hurtful and unsafe, and that it should be avoided by skill in management, no matter how safe the agent used may be considered.

That such conditions do not occur without warning through the failing functions of organic life, is the fortunate result of the harmony and dependent action of the nervous centres, and these functions of organic life are commonly and very properly watched, as *the* means of control in the administration of anæsthetics. But apart from the fact that a most hurtful and dangerous degree of asphyxia may be induced suddenly, and while both pulse and respiration are spasmodically kept up by the stimulus of the first effect of the agent used, there are grave accidents which occur to the centres of organic life, both by reflex action from the brain proper, and by the presence in the circulation of such powerful depressing agents. Blood overcharged with anæsthetic vapors, and particularly when imperfectly aerated and slowly circulated, must necessarily fail of its due impression upon the cardiac and respiratory ganglia, and paralysis of the heart, or muscles of respiration are, therefore, the common fatal accidents of anæsthetic practice.

All these circumstances lead directly to the conclusions, first, that anæsthetics should be given slowly and carefully, with free, unlimited admixture of air, so that there should never be any choking or spasmodic action of the glottis. Secondly, that they should only be given at the time when the effect is needed, and be abandoned the moment the necessity is passed. Thirdly, that not only should the pulse and respiration be watched carefully during the whole period of insensibility, and be kept as near the normal standard as possible, but the slightest amount of blueness or lividity should be regarded as an indication of asphyxia, and be promptly responded to by a more free admission of air.

In the choice between the two anæsthetics in common use, one or two points are deserving of attention.

Chloroform is much less liable to produce cyanosis or asphyxia, because it is effective in much smaller quantity than ether, and does not therefore displace so much air in the respiratory process. The writer has never noticed any degree of blueness from the use of chloroform, but has often seen it in the use of ether. On the other hand, unless chloroform be given with far more care than is necessary with ether, it is, from its greater efficiency, much more liable to produce hyperanæsthesia, and to paralyse the heart and respiratory muscles. Hence chloroform, under ordinary circumstances, must be considered more dangerous to life, because its greater efficiency and activity, while they render it less liable to produce asphyxia, render it more liable to produce the other accidents of anæsthetic practice. The balance against it is, however, more applicable to its common and indiscriminate use, than when applied with the care and precaution indicated in the foregoing remarks; and there is probably quite a large class of cases in which it cannot judiciously be replaced by any other agent, as, for instance, in parturition; in uremic convulsions of gestation and parturition; and, in short, whenever an intermittent and prompt effect are desirable, and the due precautions can be rigidly observed. In careful practice, with ordinary good judgment and observation, it has in the writer's opinion, the advantage over ether in every point except the single important one that, in rare instances, it is liable to produce sudden fatal paralysis of the heart.

Ether has been regarded as so safe an anæsthetic, that it is scarcely admitted as susceptible of doing harm; and the impression is very common that it can never endanger life. That either of these propositions can be accepted admits of great doubt.

In the asphyxia from drowning, if the immersion be of short duration, and if the muscular system has not lost its vital tonicity, it is usually only necessary to re-establish the respiration and circulation for a short time, by artificial means, to restore life. If that drowning be prolonged, however, by repeated short immersions, so that the same inefficient condition of the circulating blood be brought about during a half or three quarters of an hour of struggling, and with depressing influences from other sources, as of previous disease or injury, so that the powers of endurance are worn out, and passive exudations are permitted to accumulate and obstruct the pulmonary air cells, the result would probably be very different. A condition of vital depression would be established which might very slowly go either way in the balance between life and death, but which would probably, in case of other coinciding influences, as after a serious surgical operation, ultimately terminate fatally. The partial asphyxia produced by a prolonged etherization is a nearly parallel case under ordinary circumstances; and here, as in other instances, pernicious influences may be masked by the complication and remoteness of the results.

So strongly has the writer's attention been drawn to these circumstances, by seeing and hearing of the profuse and wasteful use of ether, that it is a prominent object of this article to invite the profession to a closer scrutiny and observation of the effects; and if two or three fluid ounces of ether be found to produce a safer and better effect than double that quantity, an important point will have been attained.

The method of administering ether adopted by some close observers is one which appears well adapted to ensure a due admixture of air. A folded napkin is rolled into the form of a cylinder, or truncated cone, and secured at the overlapping edges by two pins. The larger end is made wide enough to cover the nose and mouth, the nose fitting into a notch, where the two edges of the napkin at the widest end fail to overlap. The opening at the small end should be at least one and a half inches in diameter, and the larger the better. If anything be needed to give stiffness and form to this cone, a piece of pasteboard laid between the folds of the napkin before it is rolled up, will accomplish this purpose. This cone is held in the hand of the person who gives the ether, and as a matter of economy it may be removed from the face during each expiration. About two fluid drachms of ether is poured upon the inside of the napkin at a time, and renewed as often as may be requisite.

In the administration of ether for anæsthetic purposes, at least three well marked stages are commonly observable, and the duration of each varies very much with the temperament of the individual, the condition of the stomach, and the quality of the ether used. One of these stages, namely, that of excitement and delirium, and the only troublesome one, has been hitherto supposed to be shorter in proportion as the ether contained less alcohol; but some very recent observations made by the intelligent House-Surgeon of the New York Hospital, Dr. Weir—though as yet very limited in number—would appear to indicate that the point of maximum, or best effect in this respect, may be overreached, or that a determinate small proportion of alcohol in the ether may be useful. At least, Dr. Weir has been very naturally led to this inference by the effect of giving a small amount of brandy before the anæsthetic; and subsequently by the use of alcoholic ether. He, however, states distinctly, that as yet his observations are not sufficiently numerous to be relied upon. An occasional accident in the prolonged use of ether, for the mention of which the writer is also indebted to Dr. Weir, is the occasional occurrence of a smart, ephemeral, irritative fever, which follows within twenty-four hours. In view of the circumstance that the local effect of ether is irritant to the extent of producing vesication when confined upon delicate surfaces, it may be easily understood that its application over the large and delicate mucous lining of the bronchial ramifications, throughout an unusually tedious and difficult operation, might produce a transient inflammatory effect. In conclusion, the writer is aware that the character and drift of these remarks are directly at variance with the teachings of some very high authorities, who regard the anæsthetic condition as one of dead drunkenness, and who advise the rapid and copious administration of the ether, in order to reach this condition in the shortest possible time.

It appears to the writer singular, that those who are in the daily habit of making the most delicate distinctions in diagnosis, should fail to discriminate between the effects of poisonous doses of alcohol and the desirable condition in ordinary anæsthesia, since they certainly do not much more nearly resemble each other than the coma of narcotism resembles natural sleep.—*American Medical Times.*

## ARTICLE XI.

*Exsection of the Right Superior Maxilla, and a portion of the Left, for Disease of Long Standing.* By Wm. H. Gott, M. D., of Readstown, Wisconsin. (Communicated by Jas. M'Naughton, M. D., of Albany, N. Y.)

I was consulted in April last by Peter Guist, aged twenty-three years, respecting a tumor of the right superior maxilla. From his own account, it appears that while residing in Morgan County, Ohio, ten years ago, a tumor of the size of a small pea was observed to be growing on the under surface of the jaw, behind the canine teeth, and attached to it by a delicate pedicle. After the lapse of a year or so, when the tumor had attained to the size of a small marble, a physician was consulted, who advised its removal without delay; it was accordingly snipped off by the scissors close to its point of attachment to the bone.

For three or four months nothing more was seen of it, and the hope was indulged that its removal would prove effectual; it, however, shortly reappeared at the site of the attachment of the pedicle to the bone, and increased in size gradually, so that by the end of a year, the alveolar process as far as the first molar tooth had become implicated.

In the fall of '51 or '52, he emigrated to Badax county, in this State. In '54 or '55, he submitted to an operation at the request of a physician, under the promise of a speedy and permanent cure. The operation had recourse to, as far as I have been able to learn, consisted in the extraction of a few of the teeth and the shaving off of the body of the tumor from the bone.

The hemorrhage following this operation was very profuse and was with great difficulty controlled; no benefit was experienced, for the tumor soon began to enlarge with more rapidity than formerly.

The foregoing history is imperfect in its details, but is as full as could be obtained from the patient. He first came under my observation in the early part of the summer of '57, soon after I commenced practice in Readstown, and his condition both general and local, was noted as follows:

A tumor, commencing just below the orbit, with a slightly elevated and abrupt edge, extending downwards and projecting out of the right side of the mouth, which is drawn to the same side, distends the right cheek to a great degree, giving rise to deformity, and also much inconvenience to the patient; the entire palate portion of the maxillary and palate bones is involved in the morbid growth, which projects from the hard palate to such a degree as to force away the lower from the upper maxilla, and thus to render it difficult for the patient to masticate his food properly.

The tumor is distinctly limited to the jaw, and does not extend beyond the limits of the bone in which it has evidently originated; is painless to the touch; firm and unyielding, except at the conical shaped point where it projects from the mouth; a sensation of deep seated elasticity is here imparted to the finger, as if the tumor was covered by a thin shell of bone which yielded when pressed upon, and appeared to recover itself upon the removal of the pressure.

Its surface is nodulated, and covered with a thick white membrane, over which numerous small blood vessels ramify, with one or two spots of superficial ulceration which furnish a little pus; pressure on the hard palate of the left side and on the tumor on the right side detected no yielding of the bone; in fact, in the latter situation, the sensation of bony hardness was imparted to the finger; the teeth, three or four of which remain, have become irregular and projecting, but are still firm in their sockets.

The growth of the tumor thus far has been slow, unattended either by pain, hemorrhage, or any appreciable derangement of the general health.

The patient was advised to submit himself without delay to the operation of excision of the greater portion of the maxillary bone, as the only course which would afford him any chance of relief. He, however, objected to undergo such an operation, and for no very satisfactory reason, and consequently passed temporarily from under my observation.

In April last he reapplied to me, fully satisfied his case would soon be beyond surgical relief if let alone, and willing to undergo any operation which would afford him a chance of his life. A careful and minute examination of his case was had, when it was found that the chances of a successful result were not as favorable as at the time of his first application. The tumor had made considerable progress, and was now found to embrace the following parts: Commencing at the inner angle of the eye, its abrupt and well defined edge, which at the first examination two years previous, was felt half an inch below the margin of the orbit, was now perceived to be on a level with it, and to reach to the junction of the maxillary with the malar bone, also to have encroached upon the side of the nose; the alveolar ridge of the left maxilla as far as the first molar tooth was found to have become implicated in the disease, as well as a portion of the hard palate of the same side to about one-third of its extent.

The tumor in its general appearance had not changed materially, excepting in its increase in size, and in the fact of its surface having become somewhat more nodulated with a greater number of vessels of larger size ramifying over it.

With the view of ascertaining, as far as possible, the nature of this growth before resorting to any operation, the exploring needle was introduced into its most prominent part, where the sensation of indistinct fluctuation was first perceived, and it appeared to enter a softish mass without resistance; it was then found that a considerable degree of *lateral motion* could be given to the instrument: a small quantity of blood followed the withdrawal of the instrument; the remaining portions of the tumor were explored in the same way, but into which the needle entered not without force, and into a dense substance where no *lateral motion* could be obtained, except with such a degree of force as would have been unjustifiable to employ.

For the past few months his general health has been on the decline, and is still so, owing partly, as he thinks, to the imperfect mastication of his food, and partly to its quality, it having been of a liquid nature mostly for some time; he is now somewhat emaciated, and incapable of the physical exertion necessary to earn a livelihood.

I was well aware of the importance of a correct diagnosis respecting the simple or local and non-malignant nature of this growth, also of the inadvisability of resorting to an operation should this be judged a case of medullary sarcoma. The diagnosis as to the growth being of the first variety was based upon the following facts:

1st. There has been but little constitutional derangement attending the growth and development of this tumor from the first; that which has of late manifested itself is undoubtedly due to causes independent of malignancy.

2d. This tumor is distinctly limited to the maxillæ, with well defined boundaries, and unlike a malignant one, which for the most part incorporates itself imperceptibly with surrounding parts. Its slow uniform growth, its firm unyielding nature, (except at one point,) the absence of pain at all times and hemorrhage, its lobulated surface, and the fact that no fungous growth has sprouted from the superficial ulcerations, nor any fetid discharge escaped from them; these circumstances, independent of the light derived from the employment of the exploring needle, combined together, render it probable that the disease is local, (if not entirely so, and if from a simple, it has insensibly merged into a malignant form in part, such a change is as yet in its early stage,) and that the performance of an operation without delay would be in accordance with good surgery, and followed by a permanent cure.

The simple nature of this tumor having been determined upon, I advised the patient to be operated upon at an early day, and the 4th of May, 1859, was fixed upon. After a few days of preparatory treatment the operation was performed as by appointment, as follows: After partial anæsthesia had been induced by a mixture of equal parts of chloroform and ether (it was not deemed prudent to put the patient under the full effect of the anæsthetic, from fear that death from strangulation from the blood passing into the windpipe might take place,) an incision was made from the external angular process of the frontal bone to the corner of the mouth. A second was then carried from the nasal process of the superior maxillary bone to the mouth near the mesial line. The tumor was now laid bare, by dissecting upwards the tissues of the cheek to the orbit into which the dissection was pursued, and its tissues detached from the floor.

The nose was next separated from the bone and held over to the left side by an assistant. This dissection completed, the operation was suspended for a few minutes, in order to secure the arteries, and to allow the patient to recover from the effect of the anæsthetic.

The tumor was now fully exposed to view. The operation having been resumed, the malar bone was divided near its middle by the metacarpal saw—then the nasal process of the maxillary by the bone cutters and chisel; the saw introduced into the nostril, the alveolar ridge was sawn through, and the hard palate to the attachment of the velum palati. The tumor being now forcibly moved and loosened by the finger introduced from behind, was lifted out after a little delay in dividing its remaining attachments. The large cavity thus exposed was immediately filled with small sponges to arrest the profuse hemorrhage, which done, the implicated portion of the left maxilla was separated by the saw and bone cutters.

The patient, much exhausted from loss of blood together from the shock of the operation, was allowed a little brandy with thirty drops of laudanum, which, with the application of dry warmth, brought about gentle reaction in a little while. The wound was allowed to remain open exposed to the air for nearly an hour, the more to guard against secondary hemorrhage, when the cavity was filled with balls of lint and the flap stitched up, and the patient removed faom the table to his bed. The only dressing applied consisted of pledgets of lint wet in cold water.

Three or four hours after the operation several small clots of blood were thrown off from the stomach, when an additional dose of opium was given to allay restlessness and pain. In forty-eight hours after the operation the sutures were removed and union by the first intention had taken place throughout the incisions. Under the free use of animal broths the patient gained in strength so rapidly as to be able to sit up out of bed on the eighth day, and at the end of another week to be about on his feet.

The general condition and health of the patient six weeks from the time the operation was performed, when he passed from under my care, appeared to be good, and were improving from day to day. The partial paralysis of the cheek consequent upon the division of the branches of the facial nerve gradually wore away, and its sensibility became fully restored. At the time of writing this report, nearly four months after the operation, the general health of the patient is better than it had been for the past year or two, and he is now engaged in his vocation, that of a farmer. His articulation is very distinct, and the process of mastication can be performed without difficulty.

I will now describe the appearance of the tumor as accurately as possible. Its weight three or four hours after the operation, was seven ounces and a half. Its greater portion was composed of a dense, more or less fibrous substance of a whitish and yellowish white color. Its central portion, where the indistinct fluctuation was perceived before removal presented a very different character, and was made up of a structure of a soft medullary nature, and very vascular. Beside the thick membranous capsule investing the tumor, and beneath it, a thin lamina of bone was spread out over its circumference, constituting the walls of the antrum.

*Note.*—In a letter to Dr. M'Naughton, dated August 29th, 1859, Dr. Gott adds the following postscript:

"I have seen my patient several times lately; he says his health is better at present than it has been for a year or two past. He is now earning his own livelihood at his occupation, that of a farmer. The parts have entirely healed, and with the exception of some falling in of that side of the face and a slight drawing down of the lower eyelid, no evidence that such a tumor had been removed from the face would exist."—*Amer. Jour. Med. Sci.*

## ARTICLE XII.

### *Exsection of the Superior Maxillary, together with the Malar and Palate Bones of the Right Side. Recovery.* By W. J. LEAKE, M. D. of Yazoo City, Miss.

THE subject of this operation was a negro man, aged about 25 years, the property of the Hon. A. P. Hill, of Madison county. He was placed under my charge about the 1st June last. At that time a large tumor occupied the right side of the face, the right eye being much protruded, the right nostril entirely obstructed by the tumor, which had also dislocated the os palati of that side, together with the corresponding palatine process of the maxilla along the posterior two-thirds or three-fourths of the mystachial suture—the anterior part of the suture being intact. The molar and bicuspid teeth of the right side had been removed some time previously. A foul discharge issued from the right nostril, and from an opening in the alveolar aspect of the tumor. The opening would have admitted the end of the little finger, being partly occupied by a tough, white substance, which came away in a few days, and proved to be a portion of the periosteum which had lined the antrum. The end of a silver male catheter was passed about an inch up the opening. The patient was much emaciated, and so much debilitated that his gait was tottering and unsteady. The pulse was feeble and frequent. His mental condition approached imbecility; appetite impaired. I have not been able to get a satisfactory history of the case previous to the time it fell under my observation. As nearly as I could ascertain, the disease commenced some two years previously, at which time the patient complained of great pain in the teeth and jaw. The teeth were extracted, but no relief obtained. When brought to me he did not complain of much pain.

For the relief of the patient, an operation consisting in the entire removal of the tumor was clearly demanded; but his condition at the time forbade any surgical procedure. He was, therefore, put upon a tonic, cordial treatment, with a nutritious diet, in order to prepare him for an operation at a future time. The local treatment consisted of detergent and astringent injections of the right nostril, and opening in the tumor. Under this treatment he gradually improved; the opening in the tumor filled up by granulations; and by closing the left nostril and mouth, and making a forcible expiration, air passed through the right nostril with a hissing sound; but a probe could not be passed.

The patient having improved sufficiently, the operation was performed on the 18th of August, and was in nearly all its steps the one advised by Mr. Liston. My partner, Dr. Barnett, and Drs. Kidd, Wilson, and Peake, were present. A cut, commencing near the inner angle of the eye, was extended down the side of the nose, beneath the ala, to the ridge bounding the sulcus of the lip, making the division of the lip through that ridge. Another cut, commencing at the same point with the first, was carried beneath the eye, in a line with the fibres of the orbicularis muscle, to a point corresponding to the transverse facial suture. The ala of the nose was next cut up from its connection with the tumor, and the soft parts dissected off the tumor and turned back. In order to command the tumor posteriorly, it was found necessary to make an additional cut, commencing at the terminus of the last, and extending along the line of the zygomatic process of the malar bone, something over an inch. The lateral incisor of the right side having been extracted by H. Lawrence, D. S., I proceeded to notch the alveolar process with Liston's cutting pliers, and to divide the palatine process through the roof of the mouth. The nasal process was then severed, followed by the division of the zygomatic process of the malar bone, and, lastly, the malar and frontal bones were severed through the transverse suture. The bony connections of the tumor were next all separated. The forceps were now applied, one branch in the orbit, the other in the mouth, and an attempt made to dislodge the tumor. In this, however I failed, the tumor crushing under the pressure of the instrument. It was found necessary to pass a broad chisel behind the tumor, after which it was dissected out with the knife and curved scissors. The lips of the wound were brought together, and secured by the interrupted suture, except through the lip, which was secured by two silver pins. The cheek was stuffed with a silk handkerchief.

Very little blood was lost during the operation. Not exceeding f℥xvj, I think. No vessel required a ligature.

The operation was done with the patient in the sitting posture, under the influence of chloroform; the head being supported by an assistant.

On account of the still rather feeble condition of the patient, it was deemed unsafe to make a profound anæsthetic impression upon him with chloroform; consequently the operation was frequently interrupted by the struggles of the patient, and delayed by the repeated administration of the anæsthetic. Notwithstanding the struggles of the patient, he had no recollection of the operation when it was concluded; and shock to the nervous system was effectually prevented.

On the sixth day after the operation the sutures were all removed, and the wound found healing by first intention, except half an inch beneath the external angle of the eye, where apposition had been disturbed by the dragging downwards of the cheek.

For two or three days, commencing about the second day after the operation, the patient had some fever, and complained of some pain in the head ; but made a rapid recovery, and about the ninth or tenth day was walking about the yard.

There was difficulty in deglutition after the operation, but much less than I anticipated. There was also great difficulty in articulation, but it gradually became better, and after the adjustment of a gold plate, by Dr. H. Lawrence, the boy articulated very well.

I was informed a few days since, by Judge Hill, that the boy's health was unexceptionable. So far there seems to be no disposition to a return of the disease.

As to the character of the tumor, I cannot pronounce confidently. The bones had been absorbed to a great extent, leaving little more than mere shells or scales. The tumor seemed partly granular, and partly fibrous, with an admixture of fat. In its removal, I cut, in the language of Mr. Liston, "beyond the disease."

The incision through the lip was done along the line bounding the sulcus, thinking that the deformity would be less. Whether it is or not, I am unable to say : but the *extent* of the cut was somewhat less than it would have been had it been carried beneath the column of the nose, thence through the sulcus.

For the purpose of stuffing the cheek after this operation, a thin gum-elastic bag, arranged so that it might be inflated after its introduction, would be an improvement on the present plan of stuffing with lint. In its flaccid state, it would be easy of introduction ; and, having discharged the air from it, it could be easily removed—while its texture would prevent it being caught on any salient point of bone. Besides these advantages, it would not absorb the secretions of the mouth and cut surface; and, consequently, would be more cleanly and comfortable.

In performing the dissection beneath the globe of the eye, I derived advantage from the use of an instrument, by which this organ was shielded from danger, and at the same time held up, so that I could see how and where to cut. The instrument was made by an ingenious blacksmith, after a model cut from pasteboard, and moulded, while wet, to fit the floor of the orbit. It is of silver; in shape much like a teaspoon, with its bowl truncated, and the handle curved in the shank, so that it stands at nearly a right angle with the bowl, having its extremity curved, so as to rest securely over the thumb. It is held between the thumb and first two fingers of the hand, while the remaining fingers rest firmly on the forehead of the patient; the assistant inserts the truncated bowl beneath the globe, as the tissues are divided by the knife.—*Am. Jour. Med. Sciences.*

## ARTICLE XIII.

*Diphtherite.* By J. H. BARBOUR, M. D., Falmouth, Ky.

THIS disease first made its appearance in this county in the spring of 1857 in epidemic form, and has been prevailing in different portions of the county ever since. Upon its first occurrence, it was a very fatal disease, and although still dangerous and fatal, it seems to have lost somewhat of its virulence. It made its first appearance in the lower portion of this county, during an epidemic of scarlet fever, and was generally recognized by physicians as being a form of that disease, and is in fact, yet so considered by some.

It did not present itself in my practice until the fall of 1857, and then also during the worst epidemic of scarlatina I have ever witnessed. I immediately recognized the destructive features of this disease. In my experience, patients that have had the scarlet fever, enjoy no immunity from diphtherite; nor do diphtherite patients enjoy any immunity from scarlet fever. During the last two years and a half it has fallen to my lot to treat a great number of patients, of all ages, sex and color, affected with this disease.

Diphtherite often commences with a chill, followed by fever, external swelling of the throat, painful and difficult deglutition, etc. In other cases the fever is intermittent, without chill, and with sickness of the stomach—the fever lasting three or four hours each day, and from three to five days before the throat symptoms are manifest, the patient appearing quite well, excepting during the fever.

In many cases the disease comes on in a more insidious manner: the patient complains but little, although it is evident from the paleness and lassitude that something is wrong; the surface is moist, cool and pale; the pulse remarkably frequent, (this frequency of the pulse I have found to be one of the earliest symptoms, indicating the approach of the disease before other symptoms were set up.)

In some cases slight external swelling of the throat. Upon pressing down the tongue with a spoon, and examining the tonsils, if the case is in its early stage, you will find the tonsils and soft palate red and slightly swollen, with one or more small patches on the tonsils of a yellowish appearance, resembling a small piece or patch of buckskin spread upon the glands. If the disease continues to progress, this membrane extends until it covers all the visible portions of the throat when the tongue is depressed; as the case progresses, this membrane may break down into an ugly, gray slough, or the false membrane be exfoliated entire.

In other cases the tonsils are covered with a grayish, ragged, sloughing surface from the first. And I have seen in two cases a smooth, milky appearance, as though the mucous membrane had been touched with a strong solution of nitrate of silver. In both of these cases the laryngial symptoms predominated from the first, and they both resulted fatally.

In some cases the tonsils are very much swollen, and a portion of the gland protruding from the base, causing it to resemble an acorn in its cup.

In bad cases I have seen the tonsils and soft palate assume a gangrenous look, and the diphtheritic membrane come of like bits of soft, thin buckskin, the soft parts under it offering no more resistance to the pencil of nitrate of silver than would tender cheese. These were fatal cases.

In a few cases I have had to contend against exhausting hemorrhage from the ulcerated surfaces of the throat.

In two cases, the sloughing of the soft palate, and the destruction of the surrounding parts has been such as to very much impair the power of deglutition; for, upon attempting to swallow, a great portion of the food or fluid would be thrown out through the nasal passages. In these cases the voice was very much impaired, or lost for the time—owing, as I supposed, probably to the destruction of the soft palate; yet, as both of these cases had laryngial symptoms, may it not have been owing in part to the disease extending into the larynx, and affecting or stiffening the chordæ vocales for a time?—for both of the cases recovered, and in a few weeks the voice was entirely restored.

The external portions of the throat in most cases were but little swollen, but in some few cases they were much swollen and œdematous.

As to the fatal termination of this disease, I consider it owing to its extension into the larynx and trachea. I have seen no cases terminate fatally excepting such as where the laryngial symptoms were present, as shown by hoarseness, difficult and croupal respiration. In such cases, patients, unless quite young, could not be forced to keep their beds, but would sit up, or walk about the room. Little ones would get up and walk across the room to get a drink of water, up to the moment of death. A little boy of ten years old set up, and whittled a stick the most of the day, and in the evening put on his coat and drew on his boots, which were rather hard to draw, a few moments before he died. The difficulty of breathing was great during this time. He could not be induced for a moment to assume any other posture but the sitting or standing one.

I do not consider diphtherite contagious. If so, it is very uncertain in its action. I have seen those most exposed, entirely escape, while those in no manner exposed have the disease.

I have never been able in pure cases of diphtherite to detect any cutaneous eruption or rash.

In the beginning with us, diphtherite was associated with scarlatina; but not of late. It also in some cases was associated with intermittent fever, as in my own case, and also in other cases that I observed during the fall of 1858. I had had an attack of intermittent fever, and arrested it with quinine. In one month it returned with a severe chill, followed by a fever. I resorted to quinine. The chill did not return, but I discovered a dryness and soreness, with severe cutting pain, upon attempting to swallow. This led me to examine my throat, when I discovered a yellow patch upon my left tonsil about the size of a half dime. I treated it, and in three days it disappeared.

*Prophylaxis.*—I have used the chlorate of potassa, in solution, given internally as a preventive.

*Treatment.*—If there is much excitement in the begining, I give an emetic of ipecac, and followed, if the bowels are constipated, with some mild cathartic, such as rhubarb. After the action of the emetic, if one is given, or otherwise immediately, I cauterize the diphtherite patches on the tonsils with nitrate of silver, applying the stick direct. I think it much neater than the solution, and can be applied where you wish it, and there only. I load the end of a quill with the stick—the best caustic holder I know of, and always at hand in a country practice. With this I cauterize the throat once every twenty-four hours, so long as necessary. I make a saturated solution of the chlorate of potassa, to which, if the case requires it, I add quinine and Bourbon whiskey.

℞ Chlorate of potassa, ℥j
Sulph. quinine, grs. xvj.
Water, ℥ xvj

Dose, from a teaspoonful to a tablespoonful every three hours, according to age. In cases where there is a pale, moist, cool skin, a frequent and soft pulse, the addition of the whiskey to the above formula will prove of great benefit.

As a stimulating gargle I use—

℞ Apple vinegar, ℥ viij.
Capsicum, ʒ j.
Muriate of soda, ʒ j. M.

Use three or four times a day as a gargle. As an astringent gargle, I use a decoction of oak or persimmon bark, cold.

As a styptic in hemorrhage from the ulcerated surface of the throat, I used a strong solution of the sulphate of zinc and ice.

The external application that I used in all my cases was a piece of old bacon bound to the throat. The bacon usually in from one to three days brings out a crop of pimples, producing a safe and valuable counter irritation. Owing to the tendency of diphtheritic inflammation to attack abraded surfaces, I do not consider it judicious to use the ordinary blistering preparations.

This course of treatment in my hands has been successful in every case but one that I saw before the laryngial symptoms were set up. It has been adopted by other physicians with like success.

As a constitutional remedy, I rely upon the chlorate of potassa and quinine, with the addition of a stimulus, when required.

As a topical application, I rely upon the nitrate of silver, with the gargles above mentioned. In many cases I allow a liberal fluid diet, if it can be taken.

[*Cincinnati Lancet and Obs.*

## ARTICLE XIV.

### *Salerno—Naples.*

Salerno was in the twelfth century, the seat of a flourishing medical college—the first, perhaps, established west of Greece. According to Gibbon, "The treasures of Grecian medicine had been communicated to the Arabian Colonies of Africa, Spain, and Sicily; and in the intercourse of peace and war a spark of knowledge had been kindled and cherished at Salerno, an illustrious city in which the men were honest and the women beautiful." I made a pilgrimage to this "illustrious" city, which, on account of its associations, I enjoyed very much. Yet, sad to relate, I could find neither "honest men nor beautiful women," and the *only* remains of the medical school that I could discover was a "string of aphorisms in Leonine verses of the twelfth century." These aphorisms were the maxims of the School of Salerno. This precious relic is now in the library of the Benedictine Monastery, which is situated high up amongst the Apennines, about five miles from Salerno. I copied from these aphorisms the following eulogium of the virtues of sage tea:

> "Cur moriatur homo, cui salvia crescit in horto?
> Contra vim mortis non est medicamen in hortis?
> Salvia salvatrix, naturæ conciliatrix,
> Salvia cum ruta faciunt tibi pocula tuta."

I dare say you have seen this eulogium before; but I send it as copied *literatim et*, etc., from the "string."

The following, also from the same "string," is of a different character, and I have no doubt was more commonly used than the sage tea:

> "Si nocturna tibi noceat potatio vini
> Hoc ter mane bibes iterum, et fuerit medicina."

The following "rules and regulations" of the School of Salerno were kindly furnished me by Padre Rossi, the archivist of the above named monastery. No person was allowed to practice medicine in the kingdom who had not been examined by this college. Proofs of legitimacy, and of having studied medicine for seven years, were required from the candidates. The examinations were public, and consisted of expositions of Galen, Hippocrates, Avicenna, etc. After a satisfactory examination, the student was to practice one year under a physician. Druggists were not allowed to dispense medicines until they had received a certificate of capability from the college.

Salerno is now a poor, deserted-looking old city. The physicians of the town seem to be "practicing medicine" and living entirely upon the reputation of their ancestors.

The medical school at Naples seems to be in a flourishing condition. The number of pupils at present is one hundred and sixteen. The students of this school all wear a uniform of blue cloth, and a hat, which, in form and color, resembles that worn by our old Continental officers. A student entering this college is obliged to remain seven years. Clinical lectures are delivered daily, in the morning, at the Hospital Degl. Incurabili.

Perhaps no city in Europe is better supplied with hospitals than Naples. The revenues, which are very large, are administered by a president and three governors appointed by the king. The "Incurabili" is a vast establishment for both sexes, having separate wards for particular diseases. The average number of patients in this hospital is two thousand. Each hospital has a convalescent establishment in the country, to which convalescents are sent. Patients whose cases are considered hopeless are sent to the "dying ward"—a barbarous and inhuman practice.

Tuberculosis is considered contagious. The Albergo de Poveri is a vast building founded by Charles III., as an asylum where all the poor of the kingdom might be received and taught some useful occupation. It contains at present about 5,500 inmates. The boys brought up in this institution are usually sent into the army. The hospital for the blind contains about two hundred inmates; it is well conducted. Besides these, there are seven other large hospitals in Naples; also, various private charitable institutions.

I think the general plan and arrangement of the hospitals of Rome superior to any I have seen in Europe. In these hospitals the wards converge to a centre where the altar stands under a dome. This form is certainly well calculated to contribute to good ventilation, and renders the service easier and more economical.

From your friend, WM. CLENDENIN.

[*Cincinnati Lancet and Obs.*

## ARTICLE XV.

### *Appeal of the Widow of Horace Wells.*

HARTFORD, *April*, 1860.

SIR:—As the widow of Dr. Horace Wells, I beg leave to address you. The discovery which my husband made, and which has so largely benefited mankind, has been to his family only a source of bitter misfortune. The experiments which he constantly made upon himself terminated fatally, and he died in fear and despair that the fame due him would not be accorded after his death.

The only inheritance which Horace Wells has left is the reputation which he had earned as a benefactor of mankind, and my highest ambition is to leave this unquestioned before the world. In pursuance of this object, it is my intention to bring this subject before the Medical Convention, to be held at New Haven during the coming summer. I feel assured that there, at least, I shall have a full and patient hearing, and that my husband's brother physicians will deliberate well before they forsake a just cause—when it is that of the widow and orphan. Although it may now be too late to do anything but justice to my husband's memory, I pray that at least this may be accomplished, and that the evidence that he is the true discoverer may be endorsed by the Medical Convention. To this end, let me beg you to give some attention to the evidence which will be forwarded to you. It has been prepared by the friends of a helpless woman, whose duty it is to redeem the memory of a good man, and rescue the credit of his discovery from the grasp of men, who, presuming upon his sensitive nature, and afterwards upon my helpless widowhood, have laid claim to a discovery which I know belongs to my husband alone.

Yours, respectfully,

ELIZABETH WELLS.

## "WHO CONQUERED PAIN?"

Amongst those who have reflected immortal honor on their age and country—those who are entitled to be esteemed benefactors of mankind, is Dr. Horace Wells, a name apparently so little known or so little regarded *now*, notwithstanding the priceless boon he has bestowed upon the human race, that the reflective mind marvels at the stolid ingratitude which has suffered his merits to be eclipsed, and permitted even temporary oblivion to rest upon his great achievements.

The gift thus bestowed upon humanity by Dr. Wells was so wonderful, so priceless, that had pagan Greece or Rome been so beholden to a man, he would have been elevated in their esteem to the rank of the beneficent deities; temples would have been graced with his statues, and incensed burned to signalize the great benefaction. Nay, so startling was his discovery, so far in advance of all others was the good conferred, that only amongst the fables of a heathen mythology, or in the marvelous tales of the "Arabian Nights," can parallels be found, where one deity or genius bestows beauty, another riches, another immortality, to still the ceaseless cravings and complainings of the human race.

That marvelous gift to life was "IMMUNITY FROM PAIN." Yes, the body of man, a bundle of nerves at the best, was to arrive at a period in its history when even the hacking knife and grating saw of the surgeon might be smiled upon by the patient himself as diseased limbs and flesh were cut asunder. Yet, while monarchs and learned academicians exulted over the invaluable benefit—while the "groaning" hospital relapsed into silence and repose before its benign approach, the great discoverer of the god-like boon was suffered to sink almost friendless and unregarded to a premature grave.

Can this be so? Is it true that in an enlightened age and amongst enlightened nations such a man should have been suffered to live almost unregarded and to perish comparatively unknown? Have the cries and shrieks of pain from battle fields and hospitals died out in eternal silence under the influence of this discovery, while he breathed his last in neglect and sorrow, and does no statue of the immortal benefactor grace vestibule or place? Can lying impostors and charlatans appropriate his honors, and, denying his merits, grasp undeserved rewards from the blinded multitude of even philosophers, statesmen, and men of science?

Dead, like the great philosopher, Sir Humphry Davy, as the consequence of pursuing too far his own discoveries—devoured, like the fabled Actæon, by his own hounds, let the world *now* come forward and do deserved, albeit tardy, justice to his merits and his memory.

Reminded once more of injustice to him by late accounts of military hospital practice on the great battle fields of Italy, Montebello, Magenta, and Solferino, if we would finally vindicate his claims to the memory of a public benefactor, action can no longer be delayed, because a few more years sped, and the host of unimpeachable living witnesses will be gone from the stage of action, leaving to another generation the performance of a sacred duty—a duty which fairly belongs to the present.

As a powerful synopsis of the case, then, as an introduction to the question at issue, let us first appeal to one of the most eloquent articles concerning this matter that we have ever seen on any subject. It is high authority, too, from the editorial department of a late number of the *Virginia Medical Journal,* published at the capital of that State.

We have given the foregoing in *advance* of the testimony to be adduced upon the points at issue, because the question thus clearly presented, when followed out in the same order by irrefragable evidence, becomes thereby of easy apprehension to all—even to those who have not time or inclination to examine a large mass of testimony in detail.

And, guided by the landmarks so plainly laid down, we shall endeavor, while seeking to do justice to the much regretted dead, so to exhibit the question in all its bearings as to avoid any tedious array of facts, whilst not a doubt will be left to weaken the claim of Dr. Wells to the high honor sought.

The great *leading fact* is undeniable in regard to the only other two claimants for the honor, that one (Morton) made his experiment with ether the 30th day of September, 1846, whilst the other (Jackson) claims the discovery "in *conjunction*" with Morton, *over his own signature*, no earlier than the 26th of October, 1846.

*This is all we have to do with as against Dr. Wells.*

And this, to them, is rendered absolutely of no value, since each, attempting to cheat the other, had rendered the testimony of either worthless as to Dr. Wells. In his quarrel with Jackson, Morton declares, over his own signature, that Jackson pronounced the discovery "a humbug," and that it was reckless in him (Morton) to use it as he does; that he (Jackson) did not care what Morton did with the discovery, "*if he does not drag my name in with it.*" Placing their assumed discovery *as late* as 26th October, 1846, in the specification of *their* JOINT *patent*, Dr. Jackson *made oath* "THAT IT HAD NOT BEEN PREVIOUSLY KNOWN." With the fact established beyond all shadow of controversy, that the time above specified was the earliest period at which either of the men claim the merit of a discovery, let us make a synopsis of the testimony in favor of the discovery made by Dr. Wells TWO YEARS *previous*.

## SYNOPSIS OF TESTIMONY.

Thos. W. Kennedy, M. D., and P. B. Mignault, M. D., made oath before Hon. Josiah Quincy, Mayor of Boston, that in the fall of 1844, while attending medical lectures given by Dr. Warren, of the Massachusetts General Hospital, they were addressed by Dr. Wells on the subject of "rendering the system insensible to pain during the inhalation of exhilirating gas." Dr. C. A. Taft testifies to the same fact, and Dr. John C. Warren certifies that these gentlemen were all in attendance on his lectures at the time specified.

Daniel T. Curtis, a citizen of Boston, also testifies before the Mayor that he was present with the medical class on the occasion referred to.

S. Fuller, M. D., of Hartford, Conn., certifies to the fact that Dr. Wells had the reputation "for more than two years prior to March, 1847, in that city, of having made a discovery which enabled him and others to extract teeth without pain, by the use of exhilirating gas; and he adds: "There is no doubt in my mind that said Wells discovered and made the first practical application of this prnciple in surgical operations."

Dr. P. W. Ellsworth declares that to his "full knowledge, nitrous oxyd gas was administered two years earlier than this, (the period claimed by Morton and Jackson,) namely, in 1844, by Wells, and that many teeth were extracted without pain under its influence, and that Wells went to Boston at that time, as I was then informed, for the purpose of introducing the gas to the attention of surgeons in that city." Dr. Ellsworth adds: "In my mind, there is not a shadow of doubt that the whole merit of the discovery of this thing rests with Wells, and with him alone."

E. E. Marcy, M. D., of Hartford, (now of New York,) testifies to operations performed by Wells, under the influence of ether, in 1844, and says:

"In conclusion, I beg leave to offer it as my opinion, *that the man who first discovered the fact that the inhalation of a gaseous substance would render the body insensible to pain during surgical operations should be entitled to all the credit or emolument which may accrue from any substances of this nature.*"

G. B. Hawley, M. D., testifies in 1847, to the fact that he "was familiar with the successful operations of Wells" in extracting teeth without pain by the aid of nitrous oxyd gas, and he alone was regarded as the author of the discovery.

John M. Riggs, surgeon dentist, of Hartford, Conn., certifies before the Mayor of that city, that in November, 1844, he was consulted by Horace Wells "as to the practicability of administering nitrous oxyd gas prior to the performance of dental or surgical operations;" that the trial was made; that the *first* experiment was successful, and subsequent operations continued to be so; "that the said Wells avowed his intention to communicate his discovery to the dental and medical faculty, and in pursuance of that intention, proceeded to the city of Boston, State of Massachusetts, for that purpose, whilst he (Dr. Riggs) continued to use the gas with great success, the patients assuring him that they felt no pain."

Mylo Lee, citizen of Hartford, testifies before the Mayor of that city to having had a tooth extracted by Dr. Wells in November, 1844, while "under the influence of the nitrous oxyd gas;" that "the operation was attended with no pain whatever."

F. C. Goodrich, citizen of Hartford, also certifies before the Mayor of that city that "during the winter of 1844" he "learned that Dr. H. Wells had discovered the mode of extracting teeth *without pain;*" that it "was accomplished by administering to the persons operated upon exhilerating gas or vapor, which, it was asserted, rendered the human system insensible to pain;" that "the Doctor was most successful, extracting from me a large firmly-set bicuspid tooth without the slightest sensation of pain;" that he witnessed "the same process by Dr. Wells upon several individuals, accompanied in every instance with perfect success."

J. Gaylord Wells, citizen of Hartford, also testifies before the Mayor "that more than two years prior to this date," March 26, 1847, that being informed of the discovery of Dr. Wells, he "inhaled the exhilerating gas, and under its influence had six teeth extracted without pain." He adds: "that for more than eighteen months from the time I first submitted to this operation by the application of gas, I heard no other name mentioned as the discoverer except that of the above-named Horace Wells."

Wm. H. Burleigh, Esq., editor of the *Charter Oak* newspaper, now of New York, testifies essentially to the same facts—namely, that two years prior to March, 1847, he had two teeth extracted by Dr. Wells without the *least suffering,* "while under the influence of the gas."

Dr. Marcy subsequently testifies further. He certifies before a magistrate of Hartford, by certificate, dated December 1st, 1849, that he "was aware of the fact of Dr. Wells' visit to Boston in 1844, for the purpose of communicating his discovery to the faculty of that city. I also had an interview with Dr. Wells soon after his return from Boston, when he informed me that he had made known to Dr. C. J. Jackson and Mr. Morton the anæsthetic properties of the nitrous oxyd gas, the ether vapor, and other analogous substances. He also informed me that he had made an imperfect trial with the gas before Dr. Warren's class, but that the experiment was not satisfactory on account of the patient's getting an insufficient quantity of the gas. He further informed me that his discovery and his whole idea respecting anæsthetic agents was ridiculed by Dr. Jackson and other medical men of Boston, *but that his former pupil, Morton, swallowed this ridiculous idea greedily, and kept it down until* 1846, *when he ejected it at Washington in the form of a patented compound—mark the word, compound—called Letheon.*"

And Dr. Ellsworth, also in another certificate of subsequent date, says: "I am perfectly aware of Mr. Wells' visit to Boston for the purpose, as stated at that time, of announcing his discovery, and giving it a fuller trial at the hospital in that city, and also his dissatisfaction with the results of his visit, both as to the success of his experiment before Dr. Warren and his class, and the reception with which his idea met." He adds: "Having full information respecting the circumstances attending the birth of this discovery, and also having carefully perused the statements of Jackson and Morton, I have seen no reason to change my opinion, or in the slightest manner doubt that to Wells alone belongs the *whole* honor of first using any substance by inhalation for the mitigation of pain.

Sixteen members of the medical fraternity of Hartford—Drs. Fuller, Sumner, Rogers, Beresford, Grant, Barry, Marcy, Taft, Dodge, Ellsworth, Russell, Hawley, Hunt, Crary, Schue, and Lee—also express their implicit reliance upon the statements made in the various certificates quoted as bearing upon the period of the discovery by Dr. Wells, and concluded their statement in the following words: "We take pleasure, also, in expressing our entire confidence in the integrity of the said Horace Wells, than whom no person in our city is more favorably known as a gentleman of honor and integrity. We know, moreover, that he has for several years past successfully devoted himself to subjects pertaining to invention and discovery."

Finally, we have the following noble and emphatic testimonial by the assembled legislative wisdom of the State of Connecticut:

"*Resolution of the General Assembly of Connecticut, of May*, 1847.

"*Whereas*, it being understood by this Assembly that Dr. Horace Wells, of Hartford, discovered, in 1844, that nitrous oxyd gas, or the vapor of ether, inhaled [by] persons, causes insensibility to pain, in amputation, or other surgical operations, which discovery has been most honorably noticed by various medical societies in London, and by the Academy of Medicine, and by the Parisian Medical Society in France, and has since been in use in England, France, and in this country: therefore,

"*Resolved by this Assembly*, That the aforesaid discovery by Doctor Wells, of Hartford, Connecticut, of the use of *nitrous oxyd gas*, or vapor of ether, in surgical operations, is of great importance to the public, and entitles the inventor to the favorable consideration of his fellow citizens, and to the high station of a public benefactor."—*Passed by the Connecticut Legislature in* 1847.

It is some consolation to know that *late* events point to a recognition of Dr. Wells by the learned world as the one *alone* entitled to the gratitude of mankind for this great discovery, and this is seen in the fact, amongst others announced, that the Hon. Truman Smith, who has hitherto, in his place in the United States Senate, defended the claims of Dr. Wells with an ability and disinterestedness beyond all praise, in a New York paper of last year, uses the following emphatic language:

"In my former communication, I stated that I had stood pretty much alone in efforts to assert the claims of Dr. Wells and the rights of his widow and child; but I am happy to say that is to be so no longer, as will appear from the following communication, which I have recently received from the Right Rev. Bishop Brownell, ex-Chief Justice Williams, and other citizens of Hartford, of high distinction:

HARTFORD, *Dec.* 18, 1858.

HON. TRUMAN SMITH,

DEAR SIR:—As the city of Hartford had the honor of giving birth to anæsthesia, or the use of gases and vapors, for the alleviation of pain, and believing that the claims of the late Horace Wells, as the author of that discovery, have not been brought as fully before the world as the case demands, we request you, at your convenience, to give our citizens a history of that great discovery, and the efforts made to deprive Dr. Wells of his just rights. T. C. Brownell, Th. S. Williams, Wm. W. Ellsworth, Seth Terry, B. Hudson, Harvey Seymour, James W. Bunce, T. M. Allen, S. B. Beresford, M. D., B. Rogers, M. D., P. M. Hastings, M. D., A. W. Barrows, P. W. Ellsworth."

But we need not multiply the overwhelming proofs. The language of Dr. Wells himself is definite and emphatic. After mentioning the *first* successful experiment, that on himself, he says: "This was in the fall of 1844. Being a resident of Hartford, Connecticut, I proceeded to Boston in December of the same year, in order to present my discovery to the medical faculty; first making it known to Drs. Warren, Hayward, JACKSON, and MORTON; the last two of whom expressed themselves in the *disbelief* that surgical operations could be performed without pain—both admitted that this *modus operandi* was entirely new to them; and these are the individuals who now claim to be the discoverers."

There is, as we have said, an emphasis in this simple statement of Dr. Wells which must convince every unprejudiced mind, the honest judgment of all men, of the shameless injustice sought to be perpetrated, and this even in the absence of the mountain of unimpeached and unimpeachable testimony we have brought forward. And these men, mark the fact, sought a *patent* for the discovery—wished to monopolize the blessings to flow from it—whilst Dr. Wells, in the publication from which we have just quoted, says, in the manner of one whose whole being overflowed with benevolence, that, whilst he was "*well assured that it was a valuable discovery—he was desirous that it should be as free as the air we breathe.*"

Why, that was the very spirit of benevolence itself, proving the discovery worthy of the source from which it emanated. No mean spirit actuated him in seeking to vindicate his claims to the high honor to which he was entitled, and mankind now, in awarding to him what is his just due, may turn to the memory of the man himself with just pride. *He is in his grave,* a victim to his great discovery, having experimented too far upon his own frail system, and for the good of mankind. No contests or awards can disturb him more; but the dishonest attempts to deprive him of his honors have aroused those who knew his worth, who will never cease battling until his claims are established.

Some stress has been attempted to be put upon a letter written by Dr. Wells, in Oct., 1846, in answer to one from Morton of a previous date, in which he cautions Dr. Morton not to dispose of certain "rights" the latter claimed to a "*compound*" he said he had discovered. This letter is fully explained by Dr. Wells in another of April, 1847, where he says:

"The letter which is there introduced with my signature was written in answer to one which I received from Dr. Morton, who represented to me that he had discovered a 'compound,' the effects of which, *as described by him*, entirely eclipsed those produced by nitrous oxyd gas or sulphurate ether; he stating that his compound would invariably produce a sound sleep, the length of which was wholly optional with the operator; that he had not made a single failure in one hundred and sixty cases, etc. He also stated that he had obtained a patent for this compound. I accordingly started for Boston to learn more of this improvement on my discovery, with which I had made him acquainted long before. While at his office I saw the (so-called) compound administered to a patient; it apparently had the same effect as the gas, which I had many times administered for the same purpose. Before I left for home, the gas was given to several other patients, *with but partial success*—at least so said the patients with whom I conversed. I then inquired about his patent, (his assumed '*rights*,') and found, to my surprise, that he had not obtained one, *nor even made an application for one;* this being done at a subsequent period, *as the date of his specifications and patent clearly show.*

*Very effectually* does this plain statement from Dr. Wells dispose of Dr. Morton's "rights" to any superior "compound" he had claimed consideration for, in his letter; and here this part of the question may safely rest.

And now a few words further as to the light in which this invaluable discovery is viewed abroad. In Dr. Roux's Report from the Committee of Eminent Surgeons and Physicians of France, on the Prizes in Medicine and Surgery for the years 1847 and 1848, the following decisive language is held:

"A splendid service has been rendered to science and humanity in the discovery of a means nearly infallible, or at least successful in the generality of cases, of rendering man temporarily insensible to pain, with a transient perturbation only, after which all the functions return to their natural play. There have been, indeed, deplorable instances of baneful effects by anæsthetic agents, from adscititious causes, but the number of them is infinitely small, compared with the prodigious multitude of trials. There is no exaggeration in asserting that, from the time—a little more than three years since—the inhaling ether or chloroform has been introduced into the practice of physic and surgery, a hundred thousand individuals—first in America and by American surgeons, who enjoy the glory of the initiative, and then in different parts of the world—have been subjected to it; and in this number, not more than twelve or fifteen disastrous cases can be cited. Owing to their particular situations, some of the members of your Committee—two particularly, Messrs. Velpeau and Ronx—have been called to pay a large tribute to science as it regards the employment of anæsthetic agents. Their single experience is imposing enough. Since the end of 1846, Drs. Velpeau and Ronx have each, apart, practiced etherization, properly so called, first; then chloroformization, five hundred times at least; a thousand or twelve hundred individuals, or more, perhaps, have been *anæsthized* by their hands or under their eyes, in order to be subjected to surgical operations more or less grave; and they, the surgeons, have never seen the practice attended with instant death; both doubt that it ever had a bad influence on the consequences or proper results of their operations; they are disposed, on the contrary, to ascribe to it a favorable influence."

The *New York Journal of Medicine*, in an able article on etherization and chloroform, uses the following emphatic language in relation to Dr. Wells:

"Although he (Dr. W.) is now beyond the reach of praise or censure, we rejoice that justice will at last be done his memory, and that professional opinion is so unanimously awarding him the sole credit of introducing and establishing the existence of anæsthetic agents;" and in another part of the same article adds: Let us hear what Dr. Warren says on this subject.

" 'In this country,' (says Dr. Warren,) 'Dr. Horace Wells, of Connecticut, made many trials of this gas in 1844. In the autumn of that year he came to Boston, and *in company with Dr. Morton*, visited me at the Medical College, for the purpose of requesting that the Medical Class should have an opportunity of hearing some remarks on THE USE OF THE NITROUS OXYD FOR THE PREVENTION OF PAIN. These remarks were actually made, and at a subsequent day a trial of the gas took place. But as I was very much occupied at the time, these occurrences made so little impression on my mind, that when, in the latter part of 1846, we were assailed in regard to Dr. Morton's first experiments for a too great facility of adopting novelties, and the facts above mentioned were brought to corroborate the charge, I was for some time not able to understand the grounds of the attack. Dr. Wells, however, in the summer of 1847, mentioned to me circumstances which recalled to my mind his visit; *and his statement was afterwards confirmed by that of Dr. Morton*. Such are the facts within my knoweledge of Dr. Wells' efforts to discover a mode of *preventing* or alleviating pain in surgical operations. It appears that he actually did prosecute his trials in Connecticut and elsewhere to such an extent, that *when the matter was investigated by the Legislature of the State, in the winter of* 1847, *his labors were thought worthy of honorable notice.*"

"And yet," says the *Journal*, "Dr. Warren claims for Boston the honor of the discovery."

That paper continues:

"Now, let it be observed that Dr. Wells has *proved* that, as early as 1844, he had performed more than twenty successful operations, while his patients were in an insensible state, under the influence of nitrous oxyd and ETHER; that he communicated the discovery of this condition, and made known these facts to Drs. Morton, Warren, etc., in the fall of 1844, namely, the discovery of an agent 'for the prevention of pain;' for the former state in their specification (*Boston Med. and Sur. Jour.*) that this is what they claim as their discovery! We cannot refrain from expressing our conviction that Dr. Wells has been very unfairly treated, and that the time has come for awarding him the justice he so richly merited. Is it unfair to suggest, or even unreasonable to conclude, that the tragical event that ended the labors of Dr. Wells was induced in a measure by the consciousness of his own deserts, joined to an apparent unconsciousness of them by his professional brethren? It is indeed a saddening reflection, that had his discoveries, to which others who enjoyed his confidence unjustly lay claim, been duly awarded him, and duly appreciated while he lived, he now might be (among) a valued and useful member. Rarely is desert awarded or even acknowledged here; too often, as in this case, justice comes too late, and it is only when reward is useless and praise an empty sound, that the name of the *true* benefactor is heard. But from his ashes let the truth arise, and in this mournful instance we can only say,

'Palmam qui meruit ferat.'"

And now, in view of what we have presented, in view of unanswerable testimony we have adduced, we call on the members of the Medical profession *everywhere* to come forward and do long-withheld justice to the memory of Dr. Wells. Let American Physicians and Surgeons especially, who, (in the language of one of the splendid tributes from abroad we have quoted) "*enjoy the* GLORY *of the initiative,*" let the American members of the profession come forward, and do simple justice to the memory of one who procured for them, at the cost of his life, the shining honor thus handsomely acknowledged by the eminent surgeons and physicians of France. *Will they do this?*

## ARTICLE XVI.

### *Fœtid Perspiration of the Feet.*

MESSRS. EDITORS:—In No. 102 *L'Union Médicale,* a M. Gaffard proposes the following remedy for "fœtid sweating of the feet." Red oxyd of lead, 1 part to 29 parts of the liquor of the subacetate of lead; the first to be bruised in a porcelain mortar, and the liquor gradually added. A few drops to be applied once a week, or oftener, in summer.

This was quoted in the January number of the "*Medical News and Library*" without editorial comment. Possibly, therefore, there may be those who believe in the popular idea that the perspiration excreted on the feet is not inodorous. Professor Hebra, of Vienna, in his lectures on the anatomy and physiology of the skin, has spoken of this notion which is current in Germany. In connection with M. Gaffard's proposed remedy for an evil which certainly does not exist, it may be of interest to quote Prof. H's remarks, which I translate from the notes of his lectures published in the "Allgemeine Wiener Medizinische Zeitung," for 1857.

Respectfully, yours,
B. JOY JEFFRIES, M. D.
15 Chestnut-st., May 2, 1860.

Speaking of the secretion of the perspiration, he says:

"There is no doubt that the sweat glands play an important part in the animal economy. Unfortunately, their physiological, and, still more, their pathological relations are but slightly understood. In general, we know that the secretion of sweat is very copious after hard work or continued bodily exertion, especially in the heat; and further, that it is under the influence of the nervous system.

"The sweat is colorless, salt to the taste, has a weak acid reaction, and a peculiar smell. It can scarcely be denied that every individual disseminates a peculiar specific odor. This is proved by dogs following their master's track, and finding him by the help of their greatly developed organ of smell. *Our* organ of smell does not possess the necessary development to enable us to determine such differences. But there are individuals whose peculiar penetrating odor can be easily recognized by every one. It is a great mistake to attribute such a disagreeable smell to the *sweat alone.* We must ascribe it to the secretion of the sebaceous glands. We may be convinced of this by simply examining an individual, the excretions of whose skin have a bad odor. On the palm of the hand, where there are only *sweat* glands, we shall not find any unpleasant smell; it will, on the contrary, be strong on those parts of the body where the sebaceous glands are numerous—as the back, and more particularly in the arm-pits. It is moreover certain that the smell does not come immediately from the *fresh* secretion, but that it exists after this has decomposed. The fresh secretion has either none, or else a slight odor of rancid fat. But if the sweat remains some time in contact with the skin, it undergoes a chemical change, and then the disagreeable smell will be perceived. We will enter more particularly into this subject when we speak of the 'fœtid foot sweat,' which long ago was considered to be a materia peccans whose elimination from the body was desirable, and with whose healthy excretion no therapeutical interference was allowable.''

* * * * * * *

''We come now to speak of a subject upon which similar erroneous views still exist. It is the so-called 'fœtid foot sweat' (bromidrosis.) We have already said that the sweat, when secreted, has no bad odor. Hence it comes that persons troubled with this 'fœtid foot sweat' have no disagreeable odor on the palms of their hands, no matter if the perspiration trickles from them. And when the feet are carefully and properly cleansed (together with the toes and nails,) they lose the highly penetrating smell when they again begin to perspire. This so-called bromidrosis localis is found most frequently in young people, who neglect proper cleanliness, and who possess no superfluity of covering for the feet, so that this is seldom changed. Hence, by the decomposition of the collected sweat, free fat acids are formed that have a disagreeable odor. These are absorbed by the pores of the leather, and one can easily convince himself, through his sense of smell, that the boots are the seat of the odor. Persons wearing a light covering for the feet and often changing it, will have little trouble from 'fœtid foot sweat.' Hence this seldom occurs in the female sex, although the perspiration is more copious in women.

"As, from what has been said, it is evident that we have to deal rather with 'stinking boots' than 'fœtid foot sweat,' the absurd ideas which are in circulation as to the evil effects of suppressing, or too quickly checking the sweating of the feet, must be entirely given up. On other parts of the body also, where the secretion has an opportunity to remain some time in contact with the surface of the skin, *e. g.* in the arm-pits, on the scrotum, perinæum, &c., a similar decomposition of the sweat takes place and a very disagreeable odor is created. The treatment of this 'fœtid sweating of the feet,' is therefore reduced to ordering greater attention to the cleanliness of the skin, and a more frequent changing of the covering of the feet."—*Boston Med. and Surgical Journal.*

## ARTICLE XVII.

### *Long Island College Hospital. Cases of Paralysis connected with Dentition; with Remarks by* PROF. F. H. HAMILTON.

THERE have been recently presented to the class six cases of paralysis connected with dentition.

*Case* 1.—A little girl nineteen months of age, in whose case the left arm is paralysed. There is wasting of the deltoid and of the muscles of the arm and forearm—with complete loss of power. The paralysis is of three months standing.

*Case* 2.—A girl of three years of age—paralysis of the left leg. The heel is raised considerably from the ground. The muscles of the leg are more wasted than those of the thigh. In attempting to walk, she drags the foot sideways.

*Case* 3.—Mary Gorham, two years and one month old. Eight months ago she had a fever, after this the mother noticed that the child could not use the left leg. There is a tendency of the foot to rotate outward, she drags the toe. Paralysis is mostly from the knee downwards. There is wasting of the limb. In this case it is to be attributed to the fever. Prof. Hamilton has never seen a case in which infantile paralysis could be attributed to the abuse or use of calomel.

*Case* 4.—Boy three years and a half old, in all respects healthy, except loss of power of left leg. No traceable cause, unless diarrhea attending teething. The limb is wasted and heel is elevated, there is dragging of the toe—sensation in the limb is perfect.

*Cases* 5 *and* 6.—Were both boys, and the paralysis confined to the right leg—presenting the same symptoms of wasting of the limb, loss of power, elevated heel, &c.; no assignable cause for the paralysis.

*Remarks.*—Infantile paralysis occurs generally at some time during the period of first teething, and seems to have a more or less direct connection with this process. There are several periods in life, in which the system or portions of the system undergo remarkable changes, and great nervous derangements are apt to ensue. The period of the first dentition, is one of these, and among the consequences of the nervous disturbances occasioned by the development of the teeth, are convulsions, hydrocephalus, diarrhea, and *paralysis*. The other periods to which I allude, are puberty in both male and female, and "the change of life," or the period of cessation of the menses in the female. I think that I have observed, also, that at the period of "change of life" in the male, paralysis and cerebral apoplexy are exceedingly liable to occur.

Infantile paralysis is more common in the legs than in the arms; yet we see it occasionally in the arms. It generally exists but in one leg, occurring in most cases suddenly, and not unfrequently after a diarrhea or fever of some form, or after exposure to the cold. Its frequent sequence to some temporary illness has often led parents to suppose that it was due to the medicine which had been given, especially to mercury; but I have never been able to trace it to the use of mercury, in any form. I have never seen the paralysis complete; it being, in the case of the lower extremities, confined mostly to that portion of the limb which is below the knee, and existing much more in the nerves of motion than in those of sensation.

The child can generally stand upon, and even walk with the limb tolerably well; but the foot turns out whenever the weight of the body rests upon it, and the gait is unsteady and insecure. He is especially unable, when sitting, to raise and extend the leg upon the thigh, but he can generally flex the thigh upon the body without difficulty. After a time the muscles become sensibly diminished in size, especially the muscles of the leg; and if the paralysis continues, the leg does not increase in length quite as rapidly as the other, and the foot becomes more and more turned out at the ankle.

*Treatment.*—First of all, if the case is seen soon after the occurrence, the bowels should be well evacuated, and the condition of the gums should be looked to. The child should then be turned out of doors, and be permitted to gather health and strength by exercise in the open air. By use, mainly, are these muscles to be again restored to action. The little patient should therefore be encouraged to walk, and if old enough he must be directed to sit occasionally upon a chair and swing his leg back and forward in flexion and extension. No apparatus ought to be employed to support the ankle or the knee, unless these joints are becoming greatly deflected, or the limb is totally unable to support its weight. When apparatus is substituted for the muscles, the muscles being thrown into disuse, are not in a condition to gain strength. Upon this point there is a popular error which needs to be corrected. When a young man begins to stoop, or his spine begins to fall to one side or the other, his friends tell him he must get a shoulder-brace or a spine-supporter—and there are always plenty of them hanging in the windows of drug-shops, patented and recommended for this very purpose. Now the probability is, that this fall of the shoulders or curvature of the spine, is entirely due to muscular weakness. The great trapezoid does not pull the scapula well back, and if we pull them back with a shoulder-brace, leaving the muscles nothing to do, they will rapidly become atrophied, and when the brace is taken off the shoulders will fall forward more than ever. It would be much better to put the brace in front, and tie the shoulders forward, and then by the constant antagonism the trapezoid would be strengthened. Those persons who carry weights upon their heads, grow straight; the spine being made to erect itself by the action of the muscles, whose power is thus developed and perfected. It is this use of the muscles in carrying the gun, which makes the soldier and the hunter so erect. The same principle applies to these cases of infantile paralysis. The limb should be kept in constant use, and no apparatus should be employed to support the limb, except in the few extreme cases mentioned. It is well, also, to bathe the limbs in cold water once a day, and to rub them freely afterwards. Galvanism and electricity also deserve a trial.

Usually the recovery is very slow, extending through a period of several years: but I have been enabled to follow the history of enough of these cases to warrant me in assuring the parents that they will almost certainly improve, and that there is a reasonable probability of a final and complete recovery.—*Am. Med. Times.*

## ARTICLE XVIII.

### *Professional Pecksniffs.*

CENSORIUS physicians have sometimes complained of pious brethren, disposed to make their religious connections useful in a business way, who obtrude their sanctimoniousness on the profession, relating their experience before medical societies, or enriching the journals with descriptions of the illness of Elder Sniffle's child, or the miraculous recovery of the Rev. Mr. Honeyman's grandmother. An amusing specimen of this class of practitioners, among whom the affectation of godliness supplies the want of knowledge and skill, is found in Mr. Sutleffe, of London, from whose work* we are about to make a few extracts:

*Hoarhound Tea keeps a saint out of Heaven upwards of* 24 *years*—"In the summer of 1800, I was asked if I wished to see a triumphant saint expire. 'Much more,' I replied, 'than to see Rome in all her pristine or present glory.' I was accordingly directed to call on Mrs. W——, of the Surrey Road, which I did, in whom I beheld the nearest approach to an animated skeleton I ever expect to see. She instantly recognized me (having often met me at the sanctuary,) and shook hands feebly. She was on the mount of God's unchanging love."

Mr. Sutleffe had the cruelty to administer hoarhound tea, which prevented the saint from "going home."

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* *Medical and Surgical Cases; selected during a practice of* 38 *years.* By EDWARD SUTLEFFE. 8vo. pp. 628. London, 1824. The book is now rare.

When informed she was out of danger, she shed tears of grief. She shortly afterwards retired to Warwickshire instead of Paradise, and grew quite lusty.

*Fatal Hemorrhage from a Bubo.*—Mr. Sutleffe was called to a young man with a sloughing bubo, where "the pulsation from the iliac artery was awful." The artery burst, and the patient quickly bled to death. "I have since thought that a ligature applied to the artery might have arrested the bleeding, if not have saved his life." On returning home, Dr. Sutleffe reflected on these words of the Apocrypha: "Oh, Adam! what hast thou done?" We presume our readers will add: Oh, Sutleffe, what didst thou *leave undone.*

*Aphonia.*—Our author, in common with his tribe, is an admirer of old women, and observes, "that old women do as well as old men, and sometimes better." In illustration of this aphorism, he mentions two cases of aphonia which baffled him, but were speedily cured by an old woman with "gin and oatmeal."

*Flannel.*—Dr. Sutleffe expresses a mortal antipathy to the wearing of flannel, quoting the prohibition of the prophet Ezekiel (chap. xliv,) "They shall not gird themselves with wool that causeth sweat."

*Uric Acid.*—A compound of rhubarb, soap, and juniper is recommended by Mr. Sutleffe, "to sweep out the kidneys, ureters, and bladder, incommoded with red gravel. I call it my *besom*, and it is thought to be an appropriate name in the circle in which I move."

*Mania.*—Mr. Sutleffe advocates the use of ground ivy in insanity. "I cannot call to mind a single case of mania where the *glecoma hederacea* has had a full trial, without eventual recovery."

*Puerperal Fever.*—A "scripturally pious" lady had puerperal fever, which completely baffled Mr. Sutleffe and his friend Dr. Sims. They had the mortification to witness "deeper advances toward despondency," in the midst of which "the scene partook not of the house of mourning, but was rather an epitome of the abode of bliss.'' Being pressed for a prognosis, our author stated: ''that in reference to the laws of the obstetric art, the patient must die; but as Dr. Sims and himself had now turned over the case to God, it was possible that she might recover.'' It does not appear that the DEITY took charge of this case, for the lady died. ''Fraught with instruction in its progressive stages, this case was singularly honored in its termination; for the children of the deceased came forth with one consent to join themselves in a perpetual covenant to the Lord and his church, where they now shine as polished pillars in the temple of grace.''

[*Cincinnati Lancet and Observer.*

## ARTICLE XIX.

*The Evils Arising from Tight-Lacing*, from the subject of an article of DR. S. C. YOUNG in the New Orleans Medical and Surgical Journal for May.

THE author considers the evils of tight-lacing as affecting—1. The osseous system. 2. The thoracic viscera. 3. The abdominal viscera. 4. The pelvic viscera.

1. The principal parts of the osseous system are the spinal column and the ribs. The former rarely becomes affected from this cause; when, however, it becomes so, the injury is of a serious nature—caries or necrosis. The ribs are more frequently injured, the most frequent result being the deformity called ''chicken-breast.'' This means a turning inwards of the ribs from continued pressure from without, materially diminishing the space occupied by the lungs. The angle of the ribs is thereby made more acute, and they are rendered more liable to fracture.

2. Among the thoracic viscera, the *lungs* suffer most from this abominable fashion. They are not allowed to expand to their full capacity—the arterialization of the blood is interfered with: cold feet, cold hands, head aches, nervousness, debility, dullness and weakness of mind, are the result of a deficiency of oxygen in the blood. The lungs become predisposed to tubercular deposit by tight-lacing, and chronic enlargement of the air-cells, produce a state similar to what is called the "heaves" in horses.

The heart, of course, suffers at the same time; it is over-taxed, becomes first irregular, and later, and not unfrequently, the seat of organic disease.

3. The liver, stomach, and intestines, suffer among the abdominal organs. The liver is crowded in an unnatural position and shape, its circulation obstructed, the glycogenic function interfered with, and thus the foundation is laid to many acute and chronic disorders.

The stomach suffers with the other organs in the general debility; it is prevented from developing itself normally, and its rotatory and peristaltic action is interfered with. The morbid and vitiated appetite of our fashionable tight-lacing ladies is frequently attributable to this cause. The pressure upon the intestines produces various evil results. It diminishes the peristaltic motion, obstructs the circulation, especially the portal; interferes with the proper performance of the function of the absorbents, and, by diminishing the abdominal cavity, forces the intestines into the pelvis; in this way—

4. The bladder and the uterus are made to suffer. The capacity of the former is diminished, and either frequent micturation or retention of the urine may result, and predispose to the deposition of stone.

More harm is done by pressure on the uterus than on any other organ. The whole catalogue of retro and ante-versions, retro and ante-flexions, prolapsus and procidentia uteri, find in tight-lacing a predisposing as well as an exciting cause. Abortions and miscarriages, with their long train of bodily and mental suffering, are produced by pressure upon the abdomen from this miserable practice.

We have perused the paper of Dr. Young with great pleasure, and fully agree with him when he remarks, that it is the imperative duty of the physician to teach woman "how much better it is to *live* unfashionably than to *die* fashionably."

## ARTICLE XX.

### *Study of the Parotid Gland.* By M. CLAUDE BERNARD.

WE have continued the series of experiments which we commenced on the motor nerve of the parotid gland. Our observations on it have been made without much difficulty on the present occasion—the natural consequence of our having previously discovered by dissection, during our first experiment, that it is a branch of the auriculo-temporal nerve. Now, you are perfectly aware that this branch of the fifth pair of nerves has innumerable anastomosing branches emanating from the filaments of the facial nerve. It is, therefore, evident that, far from contradicting the results of our experiments on the section of the facial nerve during our researches on it in the interior of the cranium, this last observation only goes to confirm them. The nerve which animates the parotid gland and presides over its secretion must consequently be one of the anastomosing branches furnished by the facial to the superficial auriculo-temporal nerve. On a level with the condyle of the jaw this latter furnishes a small branch, which pursues its course alongside the internal maxillary artery; but following a direction the inverse of that of the current of the blood: it then enters the parotid gland, where it ramifies freely. It is this bundle of nervous filaments which we must henceforth consider as the motor power of the parotid gland; and we must completely extirpate them in our dissection if we desire to arrest the secretion. The same results have been obtained in the course of our experiments on two other dogs.

"The discovery of the properties of this bundle of nerves presents under different points of view no small amount of interest. Call to mind the opinions which were formerly in vogue with reference to the parotid gland; it was regarded as absolutely passive in the act of insalivation; it was regarded by all physiologists as a kind of sponge, which the movements executed by the animal during mastication must have pressed in order to make the saliva flow. It is true that the gland was observed to become active during the trituration of alimentary substances, and no nervous filament was recognized the direct excitation of which was supposed to stimulate the secretion; the conclusion, therefore, seemed to be quite legitimate. To-day, you must observe, this opinion is no longer admissible; for during our galvanization of the nerve, this filament, which is no longer serviceable (seeing that it is cut,) does not give rise to any pain; no movement is produced; the jaws are motionless: it is not, therefore, to mastication that we are to attribute the flow of saliva which follows the galvanization; here there is an important fact which science has acquired.

"The parotid gland does not play an absolutely passive part in the insalivation of aliments.

"But this discovery may be turned to advantage in a more general point of view in our study of the circulation of the glands. The mechanism of the secretion was formerly explained by a hypothesis founded on purely mechanical grounds; the pressure of the blood in the vessels which lead to the glands was supposed to determine through their sides a transudation which was believed to pour into the acini a special product for each of the secreting organs. Ludwig has clearly demonstrated the inadmissibility of this hypothesis; he proved that an amount of pressure much more considerable than that occasioned by the circulation of the blood could be applied to the glands without exciting in any way the activity of their secretion. He adapts a manometer to the excretory duct of the submaxillary gland, he then ties this canal so as to completely prevent the escape of the secreted products; he at length excites, by means of galvanism, the motor nerve of the gland, that is to say, the chorda tympani; operating in this manner, we obtain, by the accumulation of the saliva, a pressure which raises the mercury to thirty or even forty centimetres; this pressure is evidently directed in an inverse sense to that exercised by the blood; nevertheless, the secretion goes on uninterruptedly. The secretion of glands is, therefore, not due to a simple mechanical cause; and it is this which the rational study of the circulation in the minor vascular systems corresponding or communicating with the secreting bodies demonstrates.

"While the gland remains in a state of repose, its venous blood is black; but no sooner does it begin to act, than its blood becomes red, and like that of the arteries, and when the vein is cut, the blood is remarked to issue forth in jerks, as if an artery had been cut. It seems, therefore, at first sight, that the circulation of the gland is accelerated, and that the secretion is the result of this new modification; but these conditions alone do not suffice to determine the physiological phenomenon; it is still necessary that nervous action should come into play. When we excite the secretion by sensations produced by moist substances, it becomes very difficult to decide between the part played by the circulation in the interior of the gland and that which is produced in the surrounding parts; the animal executes movements of deglutition, moves the jaws and thus causes the blood to flow from all sides toward the vessels of the gland. Nothing of the like kind takes place when we apply direct excitation, by means of galvanism, to the motor nerve. The animal experiences not the slightest sensation; he remains motionless, and the circulation proceeds with the most perfect regularity. It is then that the observer is placed in excellent conditions for studying it. We have already adopted a method of procedure, as regards this subject, in the case of the sub-maxillary gland, but it has been impossible for us, up to the present moment, to repeat the experiment on the parotid, and it is especially with a view to this object that we have undertaken a search for the motor filament of this latter gland; for, if it were possible to compare, loupe and scalpel in hand, the act of secretion which takes place in two different glands, such, for example, as the parotid and the submaxillary, and to apprehend, at a glance, the difference and the analogy existing between them, an immense step would thus be made toward the discovery of the real essence of this important physiological function.

"The study of the properties of this nervous filament is fraught with interest in other respects: we know, for example, that by injecting into the torrent of the circulation certain substances, camphor for instance, the salivary secretion is powerfully excited; this is a subject which it is our intention to investigate, and especially for the purpose of ascertaining the nervous action which may determine it.

"Formerly, during my investigation of the subject of diabetes produced by lesion of certain parts of the encephalon, I proved that a well-marked salivation could be produced in an animal simply by wounding certain definite points. The wound which determines these accidents in the economy must be made on the floor of the fourth ventricle. Now when the cutting instrument chances to deviate to the right or the left, instead of acting directly on the median line, there is observed to take place a diminution in the flow of saliva from the gland of the same side; but when the wound is made directly over the median line the flow is the same on both sides.

"We have also remarked that the submaxillary gland furnishes more saliva than the parotid. To what is this difference to be attributed? The wound, as we stated, is made on the floor of the fourth ventricle, but the salivation takes place only when the point of the cutting instrument, being directed forward, wounds the parts adjoining the origin of the fifth pair of nerves. It would appear, therefore, that an injury bearing directly on the nervous centre, which presides over the salivary functions, immediately gives rise to the secretion dependent on it; in fact, we know that it is through the medium of the fifth pair of nerves that most of the reflex actions are produced, which exercise on these glands such a powerful influence; in this nerve may be said to terminate the greater part of the gustatory impressions which may be called the ordinary source of the salivary flow. We have frequently repeated an experiment which goes to confirm the truth of what we have just stated. Cut the lingual nerve, galvanize its peripheric extremity, no result follows; give vinegar to the animal, still no effect is produced; the nerve which should transmit the impression, being divided. But if you galvanize the other extremity of the nerve, thus acting directly on the nervous centre, you will produce a secretion similar to what is observed under ordinary circumstances; but if, instead of acting on the nervous centre by galvanization of the lingual nerve, you irritate directly the nervous centre itself, you will then produce a salivary diabetes, if I may be allowed to use such an expression.

"But, in addition to this, there exists certain poisons which act directly on the salivary glands; woorara, for example, which, as you know, kills very rapidly, by producing phenomena characterized by general paralysis, induces at the same time an abundant flow of saliva, which is to be explained, no doubt, by the complete relaxation which produces in the entire glandular tissue.

"It may be objected that the asphyxia which this poison causes of itself suffices to explain the phenomenon: in order completely to solve the question, I injected some woorara into one of the small arterial branches which anastomose with the artery of the gland, at the same time taking care to open all the veins. In this way I poisoned the acini of the gland without poisoning the animal; I thus obtained a flow of saliva which it was impossible could have been produced by any other cause than the woorara.

"Worrara acts, therefore, on the *salivary* glands in the same way as it does on the other glands of the economy. Now, we are aware that this toxic agent acts especially on the extremities of the motor nerves; but how does this action on the extremities of their nerves affect the glandular bodies themselves? This is a difficult question, which we shall endeavor to solve at some future time. It has been our object, on the present occasion, merely to show you that a nervous centre presides over the salivary function. Having shown you that a permanent salivation may be produced in animals by artificial means, it follows that there exists a special nerve whose duty it is to preside over the action of each of the glands; and the discovery which we have recently made completes the series of proofs on which this doctrine is founded."—*Med. Times and Gazette.*

## ARTICLE XXI.

### *Two Cases of Interstitial Keratitis with Teeth of the Heredito-Syphilitic Type.*

Any one who has access to St. Bartholomew's Hospital, and who is desirous to make himself acquainted with the dental malformations indicative of hereditary syphilis, may examine two typical examples of them in patients now in Darker Ward. Both the patients are boys, aged fifteen, and both are under care for interstitial keratitis. According to the views now entertained at the Opthalmic Hospital, this form of inflammation of the cornea occurs almost solely in the subjects of inherited syphilis, and it is a matter of established clinical observation, that those who suffer from it, almost invariably exhibit remarkable peculiarities in their teeth. Occasionally it occurs before the second dentition, and then the teeth are no guide in diagnosis, as the peculiarities are manifested only in the permanent set. The malformations to which we refer mostly effect, in greater or less degree, all the incisor and canine teeth of both jaws, but the central incisors of the upper jaw are those most commonly and most peculiarly modified. These latter may indeed be regarded as the test teeth in reference to this question, and any one not familiar with abnormal dental types will do well to confine his attention to them in attempting to establish a diagnosis as to inherited syphilis.

"Our immediate object in alluding to this subject at the present time is simply to draw attention to Mr. Stanley's two cases, for it is not often that such well-marked ones are met with in the wards of our general hospitals. At the opthalmic hospitals, syphilitic teeth may be seen every day, but it is because their subjects are brought there on account of the keratitis from which they usually suffer at or near the period of puberty.

The following are brief particulars of the cases to which we refer. It will be seen that we have not been able to obtain any history from the patient in either instance. It is, however, one of the great advantages of a knowledge of the typical form of teeth, that it enables its possessor to dispense with the necessity for asking direct questions, which always occasion annoyance, and are usually answered without any regard to the truth.

"CASE 1.—*Double Interstitial Keratitis of much Severity at the age of Thirteen. Characteristic Teeth. History of Eye Disease of an Elder Sister.*—W. L., aged fifteen, is a tall well-grown lad. The bridge of his nose is not much widened or sunken. His forehead is slightly protuberant, and his face shows patches of psoriasis. His palate is very high and narrow. He is rather deaf. He states that he is the second of three children. An elder sister, aged eighteen, has suffered from 'bad eyes,' and is now quite blind of one. A younger sister, aged thirteen, is believed to be in good health.

"*State of Eyes.*—Both corneæ are extensively opaque by the interstitial deposit of lymph. They are also, as is not unusual after a long and severe attack, thinned in the centre, and pushed forward so as to be more convex than is normal. The disease is now slowly subsiding, and the clouds of opacity are gradually being absorbed. The left eye was the first attacked, and its fellow began to inflame about eighteen months ago. The right was not affected until three months later, but they have since suffered with almost equal severity.

"*State of Teeth.*—The central upper incisors are very peculiar indeed, and are of the form most unmistakably typical. Instead of becoming wider from side to side as they project downward, they are narrowed and their corners are rounded off. In the centre of their cutting edge is a deep vertical notch which is prolonged upward as a shallow groove in the middle of the front surface of the tooth. The teeth are carious at their necks. The lateral incisors are so much destroyed by caries that their original form is not recognizable. The lower teeth are all of good form, with the exception of the central incisors, which are narrow, peg-like, and notched.

"CASE 2.—*Double Interstitial Keratitis at the Age of Twelve. Syphilitic Physiognomy. Characteristic Teeth.*—George M., aged fifteen. This lad is of pale complexion, broad, sunken nose, and flabby skin. He is the eldest living of a family of five—two older than himself having died in infancy (one at six months and one at two months.) He has suffered for several years from purulent discharge from both ears, and is now partially deaf.

"*State of Eyes.*—His right eye was first attacked about three years ago, and the left some time subsequently. The left cornea appears never to have suffered so severely as the other, and is now clear, excepting a slight haze in its lower part. He can see to read with the left, but is troubled with muscæ and black spots. The right cornea is still very extensively diseased, the masses of deposit being unusually large and dense.

"*State of Teeth.*—The central upper incisors present each a broad notch in their cutting edges. They are not particularly narrowed, and though not nearly so peculiar in form as those in William L's case (see above,) they still present the same feature (an atrophy of the middle lobe of the tooth-edge,) and are sufficiently characteristic. The lower incisors are serrated, but not much notched.

"Among Mr. Dixon's out patients at the Opthalmic Hospital there are at present many very good examples of the syphilitic type of teeth in conjunction with interstitial keratitis. In one instance three children (a sister and two brothers) are all affected by the same form of disease, and all present the same type of dental abnormities. It is most interesting, however, to observe the gradations in severity according to the age of the patient, both in regard to the eyes and the teeth. The girl is the eldest living of the family, and her teeth have suffered most severely, while her countenance is repulsively deformed by the effects of infantile syphilis, her forehead being protuberant, bridge of nose level with cheeks, large scars at angle of mouth, etc. Her next brother presents characteristic teeth, and has suffered a well-marked attack of keratitis, but his physiognomy is not very peculiar, while the third presents, both as regards eyes and teeth, a still less well-marked condition of things. They have three younger brothers who are reported healthy. The history given is that both father and mother went through the ordinary course of constitutional syphilis and mercurial treatment soon after marriage, and that their two eldest both died in infancy of inherited disease. The girl (their third) is stated to have suffered severely from the usual symptoms in infancy, but got through them. Neither of her brothers are remembered to have had anything noticeable in infancy. It is worthy of remark, in relation to the following case, that the girl is deaf, partially paralytic in her right arm, and almost an idiot as regards intellect."

[*Med. Times and Gaz.*

## ARTICLE XXII.

*The Jigger.* Read before the San Francisco Medico-Chirurgical Society, by I. Rowell, M. D.

There is probably no insect that afflicts the human subject, about which so little is known by medical men generally, as the one named at the head of this article; and yet in those sections of country where they abound—viz. Central America, the West India Islands, and in Texas, and some other states of the American Union, they are a great terror and scourge to some classes of the inhabitants. The name is derived from the Spanish *chiquito* small, and is expressive of its diminutive size. This insect, which, when newly born, is invisible to the unaided eye, penetrates the human skin, where it feasts and fattens in safety, and grows to an enormous size, compared with its former proportions. Another and most dangerous quality of this insect is its faculty of propagation, by which it literally fills the unfortunate victim with a numerous family of young jiggers, causing the most intense irritation, inflammation, and swelling. I have seen the natives of Central America crippled for life; their lower extremities distorted with the most hideous deformity and alive with jiggers of all ages and sizes, from the freshly lain eggs of the insect to the full-grown jigger. Nothing but amputation affords any relief in this stage of this distressing malady. To what size they will grow, or what length of time they will live in the human flesh, I am unable to give even an approximate opinion.

Some seven years since, I removed one from the thigh of a laborer in the city of San Francisco, about six months subsequent to his time of service on the Panama railroad, where he was supposed to have contracted the insect. This was the largest that I ever saw, being at least one-fourth of an inch in thickness, and from an inch and a quarter to an inch and three-eighths in length, and tapering at each extremity like the finished end of a cigar. The part was swollen and inflamed, and appeared externally like an ordinary boil. It lay encysted just beneath and perpendicular to the surface. I carefully removed the cyst, which, according to New Grenadian surgery, contains the ovaria, which, if left behind, would soon be hatched into a numerous family of jiggers more dangerous than the parent stock. This patient soon left the city, and I never learned whether he was further troubled with jiggers.

The next case which came under my observation was Mr. A. B., drayman, a resident of San Francisco for the last seven years, aged 40, of good health. He had been engaged in cutting wood in the neighborhood of Lone Mountain Cemetery. He came to my office January 20th, 1860, complained of a burning pain on the surface in the epigastric region. On examination of the part it was found to be painful to pressure, with a bright areola extending some two inches around a central puncture like a bee-sting. I told him he had probably been bitten by some poisonous insect, ordered it painted with tinct. iodine sat., and gave the subject no further consideration. Twenty days subsequently, (Feb. 10th,) he came complaining of a similar pain on the back nearer the lower dorsal vertebræ. This presented the same appearance as the former without the puncture in the centre. On pressing, it gave to my finger a slight sense of fluctuation, and a burning lancinating pain to the patient. He told me that he had suffered this burning itching pain, with redness and swelling of the surface, since he first called on me; and that the swelling had moved once and a half round his body during the interim. A puncture through the skin in the centre and left portion of the swollen part, followed by pressure on either side of the opening, brought forth a live jigger one-eighth of an inch in thickness, and three-fourths of an inch in length. As Mr. B. has not been engaged in cutting fire-wood for twenty days past, he believes, and with reason, that the insect has been an inhabitant of his flesh ever since his first call, and that he has burrowed once and a half around his body. It was not, like the former, encysted. This is the first native California jigger that I have met with. In its habits it appears to differ from the Central American, being migratory. I report this case, hoping others may add their experience upon this apparently trifling but really important subject.

[There is very little known of the jigger by medical men generally who have never been in the region of country where they abound; but a more important subject could not occupy the attention of the medical profession of the present day. The immense amount of traveling through the tropical regions where persons are liable to contract this insect, and going thence to other remote regions of the globe might suffer beyond measure, or even die without the cause being suspected.]—*Editor San Francisco Medical Press.*

### ANOTHER ACCOUNT BY JOSEPH HAINE, M. D.

At a meeting of the Medico-Chirurgical Association, the subject of the jigger was discussed, and several of the members expressed a wish to extend their knowledge of it. And the remarks made during the discussion led me to believe that altogether too little attention had been paid to it by medical journals, particularly of this coast, considering its great practical value to medical men and travelers to and from the Atlantic States through the tropical regions. In 1849, being about fifteen days from Callao, on board the Belgian ship *Charles Quint*, bound for San Francisco, one of the passengers complained of having felt at the bottom of his foot, near the big toe, a kind of itching, which had become somewhat painful. I examined the foot, and observed a dark blue round spot about three lines in diameter. There was no swelling nor redness around this spot, which had the appearance of some foreign body having entered the foot. On opening it, a drop of brown liquid came out, and after a little pressure a kind of reddish semi-transparent pouch as big as a sweet pea. This pouch bursted and little eggs similar to those of the fly came out in a great quantity. Some of the sailors being present at this little operation performed on deck, cried out, "Doctor, that is a jigger, put immediately cigar ashes into the wound, or the man will lose his leg." Instead of ashes I used nitrate of silver; in three days, the patient complaining of severe pain, I opened the little wound, and on pressure another quantity of eggs came out. I repeated the cauterization, two or three days after in pressing the wound, a few more eggs came out. I repeated the cauterization a third time, and healing took place. After this time several of the passengers in examining their feet, found out that they also were in possession of jigger's eggs, which were destroyed by the same process; the only difference being that two of them had them on the big toe right under the nail.

Returning from Europe in 1854 I crossed the Isthmus of Nicaragua. About two months after my arrival in San Francisco, I felt for a few days an itching sensation, not unpleasant, on my big toe, and happening by chance to look at it, discovered a black spot, similar to that of the jigger, but could hardly believe that after about three months, I would find the jigger's progeny in my own toe, there was no swelling, no redness, nothing but a black spot just under the beginning of the nail. I opened it with a lancet, and on pressing was not a little surprised to see the pouch coming out. I tried to extract it without bursting it, but in vain ; plenty of eggs were visible, held together by a sort of mucuos liquid. By hard pressure I thought to have seen the last of them, and cauterized the wound, which gave me a burning sensation throughout the day. The next day my toe was somewhat swollen, and a slight suppuration had taken place ; through pressure several more eggs came out. For three days I had the same sensation of burning, with redness and swelling of the toe. I cauterized every day ; finally the wound healed. I counted over four hundred eggs.

A bright little daughter of the well known actor Ned Bingham, residing at the house of one of my patients, was brought to me to be examined ; I was informed that she had returned with her father from the Nicaragua Walker expedition, where several of her family had died and her father been wounded. She complained of sore feet. I dont exactly remember how long it was after her return from Nicaragua. On examining her feet, I found black spots on the soles, which I had no doubt were jigger's nests, and one of them I was convinced of it. They all contained large quantities of eggs ; I believe I opened as many as fifty, not only at the bottom of the feet, but on and between the toes, and several on her legs. I lost sight of her after a few days, she was taken away by her father. Since that time I have never had anything to do with jiggerdom. Till now I have never seen the insect called jigger, nor have I spoken with any person having seen it, nor can I give any description of it. A certain fact is that I have seen numbers of its eggs.—*San Francisco Medical Press.*

# ARTICLE XXIII.

## *Comparative Dietetic Value of Fermented and Aerated Bread.* By J. Dauglish, M. D., of Tunbridge Wells.

Since the new process of preparing bread has been introduced—a process which effects the raising of bread wholly by mechanical means, imparting to it the most perfect vesicular structure, while it leaves the constituents of the flour wholly unchanged and uncontaminated—there has not been wanting those who doubt whether the process of fermentation, by which bread has been hitherto prepared, is not really beneficial in other respects than that of imparting the vesicular structure to it; whether, in fact, the changes which the constituents of the flour—especially the starch—undergo, are not essential to healthy digestion in the stomach.

Although I believe there are few members of the medical profession who will be prepared to maintain that fermentation is beneficial, still, as some do hold such an opinion, and have asserted likewise that starch which has not undergone the fermentive process is wholly unfit for human food, I am desirous of stating what I believe are good reasons for rejecting the process of fermentation for the new one which I have introduced.

In order to dispose of the assertion that starch requires to be prepared by the fermentive changes to render it fit for human food, it is but necessary to remark, that the proportion which the inhabitants of the earth, who thus prepare their starchy food, bear to those who do not, is quit insignificant. Indeed it would appear that the practice of fermenting the flour or meal of the cereal grains is followed chiefly by those nations who use a mixed animal and vegetable diet, while those who are wholly fed on the products of the vegetable kingdom reject the process of fermentation entirely. Thus, the millions of India and

China, who feed chiefly on rice, take it for the most part simply boiled; and that large portion of the human race who feed on maize, prepare it in many ways, but they never ferment it. The same is true with the potato-eater of Ireland, and with the oatmeal-eater of Scotland. Nor do we find that even wheat is always subjected to fermentation; but the peculiar physical properties of this grain appear to have tasked man's ingenuity more than any other, to devise methods of preparing from it food which shall be both palatable and digestible. In the less civilized states, a favorite mode of dressing wheat grain has been, by first roasting and then grinding it. On the borders of the Mediterranean it is prepared in the form of maccaroni and vermicelli, while in the East it is made into hard thin cakes for the more delicate, and for the hard-working and robust into thicker and more dense masses of baked flour and water. Even in our own nurseries wheaten flour is baked before it is prepared with milk for infants' food. The necessity for subjecting wheaten grain to these manipulations arises from its richness in gluten, and from the peculiar properties of that gluten. If a few wheaten grains are taken whole and thoroughly masticated, the starchy portions will be easily separated, mixed with the saliva and swallowed, whilst nearly the whole of the gluten will remain in the mouth in the form of a tough tenacious pellet, on which scarcely any impression can be made. A similar state of things will follow the mastication of flour. In this condition, the gluten is extremely indigestible, since it cannot be penetrated by the digestive solvents, and they can only act upon its small external surface; hence the necessity to prepare food from wheat in such a manner as shall counteract this tendency to cohere and form tenacious masses. This is the object of baking the grain and the flour as before mentioned, of making it into maccaroni, and of raising it into soft spongy bread; by which latter means the gluten assumes a form somewhat analogous to the texture of the lungs, so that an enormous surface is secured for the action of the digestive juices; and this I believe is the sole object to be sought in the preparation of bread from wheaten flour.

Wheat is said to be the type of adult human food. It supplies, in just proportions, every element essential to the perfect nutrition of the human organism. And yet in practice we find that the food which we prepare from it, and furnish to the inhabitants of our large towns and cities, is quite incapable alone of sustaining the health and strength of any individual. This is the more remarkable, since in Scotland we find that the food prepared from the oat, a grain possessing the same elements of nutrition as wheat, though in a coarser form—furnishes almost the exclusive diet of a very large number of the hardiest and finest portion of the population.

The deficiency of wheaten bread in affording the nourishment due to the constituents of the grain, is to be attributed solely to the mode of preparing the flour, and the process followed for making that flour into porous bread. The great object sought after both by the miller and the baker, is the production of a white and a light loaf. Experience has taught the miller that the flour which makes the whitest loaf is obtained from the centre of the grain; but that the flour which is the most economical, and contains the largest proportion of sound gluten, is that which is obtained from the external portions of the grain. But while he endeavors to secure both these portions for his flour, he takes the greatest care to avoid as much as possible, by fine dressing, &c., the mixture with them of any part of the true external coat which forms the bran, knowing that it will cause a most serious deficiency in the color of the bread after fermentation.

It is generally supposed that the dark color of brown bread—that is of bread made from whole wheaten meal—is attributable to the colored particles of the husk or outer covering of the grain. But such is not really the case. The colored particles of the bran are of themselves only capable of imparting a somewhat orange color to bread, which is shown to be the fact when whole wheaten meal is made into bread by a process where no fermentation or any chemical changes whatever are allowed to take place. Some few years since a process was invented in America for removing the outer seed coat of the wheat grain without injuring the grain itself, by which it was proposed to save that highly nutritious portion which is torn away, adhering to the bran in the ordinary process of grinding, and lost to human consumption. The invention was brought under the notice of the French Emperor, who caused some experiments to be made in one of the Government bakeries to test its value. The experiments were perfectly satisfactory so far as the making of an extra quantity of white flour was concerned, but when this flour was subjected to the ordinary process of fermentation and made into bread, much to the astonishment of the parties conducting the experiments, and of the inventor himself, the bread was brown instead of white. The consequence; of course, has been that the invention has never been brought into practical operation.

It has been estimated that as much as ten or twelve per cent. of nutritious matter is separated adhering to the bran, which is torn away in the process of grinding, and until very lately this matter has been considered by chemists to be gluten. It has, however, been shown by M. Mège Mouries to be chiefly a vegetable ferment, or metamorphic nitrogenous body, which he has named Cerealin, and another body, vegetable Caseine.

Cerealin is soluble in water, and insoluble in alcohol. It may be obtained by washing bran, as procured from the miller, with cold water, in which it dissolves, and it may be precipitated from the aqueous solution by means of alcohol; but, like pepsin, when thus precipitated it loses its activity as a solvent or ferment. In its native state or in aqueous solution, it acts as the most energetic ferment on starch, dextrine, and glucose, producing the lactic and even the butyric changes, but not the alcoholic. It acts remarkably on gluten, especially when in presence of starch, dextrine, or glucose. The gluten is slightly decomposed at first, giving ammonia, a brown matter, and another production which caused the lactic acid change to take place in the starch and glucose. The lactic acid thus produced immediately combines its activity with that of the cerealin and the gluten is rapidly reduced to solution.

The activity of cerealin is very easily destroyed by most acids, also by the presence of alum; and while it is the most active agent known in producing the earlier changes in the constituents of the flour, it cannot produce the alcoholic, but as soon as the alcoholic is superinduced the cerealin becomes neutralized and ceases to act any longer as a solvent. The action of cerealin upon the gluten of wheat is precisely similar to that of pepsin on the fibrine of meat. Pepsin acting alone on fibrine dissolves it, but very slowly, but if lactic acid be added solution takes place very rapidly. In like manner the starch present with the gluten of wheat is acted upon by the cerealin, and produces the necessary lactic acid to assist in the solution of the gluten by cerealin.

With the knowledge thus obtained of the properties of this substance cerealin, it is not difficult to understand why the administration of bran-tea with the food of badly-nourished children, produces the remarkable results attributed to it by men both experienced and eminent in the medical profession; and why, also, bread made from whole wheaten meal, which contains all the cerealin of the grain, should prove so beneficial in some forms of mal-assimilation, notwithstanding the presence of the peculiarly indigestible and irritating substance forming the outer covering of the grain. It will be seen that in all the methods of bread-making hitherto adopted, the peculiar solvent properties of this body, cerealin, has been sought to be neutralized simply because it destroys the white color of the bread during the earlier stages of panary fermentation. It is by thus destroying the activity of the special digestive ferment which nature has supplied for the due assimilation by the economy of the constituents of the wheaten grain, that wheaten bread is rendered incapable of affording that sustenance to the laboring man which the Scotchman obtains from his oatmeal porridge. Although the new bread has been as yet but little more than experimentally introduced to public consumption, I have already received from members of my own profession, who have recommended it in their practice, as well as from non-professional persons, accounts of the really astonishing results that have followed its use in cases of deranged digestion and assimilation. Private gentlemen have sought interviews with me to record the history of their recovery to health, after years of suffering and misery, by the simple use of the bread as a diet. Children that have been liable to convulsive attacks from an irritable condition of the alimentary canal and nervous system, have been perfectly free from them immediately the new bread was substituted for fermented bread. And cases are now numerous that have been communicated to me by medical men of position, in which certain distressing forms of dyspepsia, which had remained intractable under every kind of treatment, have yielded as if by magic almost immediately after adopting the use of the aërated bread. The delicate flavor of the new bread renders it peculiarly grateful to the stomachs of invalids and children, as well as of those whose tastes have not become vitiated by the habitual use of baker's bread, which is slightly sour, and tastes of yeast. The new bread was supplied to two wards in Guy's Hospital, in place of the ordinary bread (which is of a very fine quality, made on the premises) for two months, and in no case were there any pieces left in the wards unconsumed, while of the fermented bread large quantities of scraps are collected daily, for the consumption of which the appetites of the patients have been deficient. I am disposed to attribute the beneficial effects of the new bread to two causes. The one to the *absence* of the prejudicial matters imparted to ordinary bread by the process of fermentation, and the other to the *presence* in the bread, unchanged, of that most essential agent of digestion and assimilation, cerealin. I believe the prejudicial matters imparted to bread by fermentation to be chiefly two—acetic acid and the yeast-plant. The first is produced in large quantities, especially in hot weather, by the oxydation, by atmospheric contact, of the alcohol produced. The second is added when the baker forms his sponge, and is also rapidly propagated during the alcoholic fermentation, and cannot of course be afterwards separated from the other materials in the manner that the yeast and the other *debris* of fermentation separate themselves from wine and beer by precipitation in the process of fining. Nor is the life of the yeast plant generally destroyed in baking, because it requires to be retained at the boiling point for some time before it is thoroughly destroyed; and bread is generally withdrawn from the oven, for economical reasons, even before the centre of the loaf has reached the temperature of 212°. It is not difficult to understand how the most painful and distressing symptoms and derangements may follow the use of bread in which the yeast-plant is not thoroughly destroyed previous to ingestion, in those cases of impaired function in which the peculiar antiseptic influence of the stomachal secretions is deficient, and is incapable of preventing the development of the yeast-plant in the stomach, and the setting up of the alcoholic fermentation to derange the whole process of digestion and assimilation.—*Medical Times.*

## ARTICLE XXIV.

### *Faradisation in Asphyxia from Chloroform.* By DR. FRIEDBERG.

A BOY, aged four years, inhaled chloroform from a sponge prior to undergoing an operation for the removal of a small tumor of the lower eyelid. At most ʒj. was employed, and in less than two minutes alarming appearances were produced. The pulse had become very small, the respiration consisted only in a short, rattling inspiration, the face was livid, and the limbs were relaxed. Windows were opened, cold water was sprinkled on the face, ammonia was applied to the nostrils, and a small sponge was carried down to the epiglottis, in order to remove any mucus and to endeavor to excite coughing—the thorax being at the same time rubbed, and sometimes dashed with cold water. These might have been employed for two or three minutes, when a further change in the child's condition was observable The pulse had now quite ceased, the countenance was that of a corpse, and the lower jaw had dropped. When the eyelids were separated to examine the pupils (which were dilated) they remained gaping. As no time was evidently to be lost, the author had recourse to artificial respiration. He did not endeavor to induce this, however, by the insufflation of air, regarding that as a very uncertain procedure. The methodical compression of the abdomen is a much better one, and was executed. While an assistant compressed the abdomen with both his hands beneath the navel, in order to prevent the viscera receding below, the author pressed the upper portion of the abdominal walls towards the diaphragm, removing the hands then immediately, in order to allow of the expansion of the lungs. This rhythmical procedure was kept up for about three minutes without any appreciable advantage. A complete relaxation of the diaphragm, in fact, existed, as there was neither resistance offered by it to the passage of the hand or any subsequent vaulting of the epigastrium. It was now resolved to Faradise the diaphragm, in order to induce its contraction. One of the conductors of Bois Reymond's induction apparatus was applied over the phrenic nerve (where the omo-hyoideus lies at the outer edge of the sterno-cleido-mastoideus,) and the other to the seventh intercostal space, pressing this latter deeply towards the diaphragm. The Faradisation was performed sometimes on one side and sometimes on the other, the stream being interrupted ten times on the contraction of the diaphragm, giving rise to vaulting of the epigastrium, a short sob occurring at the same time. The Faradisation being now suspended, a slight spontaneous inspiration occurred, which was followed by a second and third, and a temporary reddening of the face, the pulse also becoming perceptible. Compression of the abdomen was again resorted to, the tension of the diaphragm now offering its proper resistance. The attempt to suspend the compression at the end of ten minutes of its employment was attended with an immediate enfeeblement of the respiration and pulse. It was therefore resumed for another ten minutes, the extremities being also rubbed, the face sprinkled with water, and ammonia applied to the nose. The recovery at last became so complete, that the operation was proceeded with and the child did very well.—*Virchow's Archiv.*

## ARTICLE XXV.

### *Salivary Calculus.* By H. B. Burnham, M. D., Epping, New Hampshire.

J. H., aged 48 years, of spare habit and slender constitution, some fourteen years since was seized with a severe pain under the left side of his tongue. He applied to his family physician, who could give him no satisfactory information as to the cause or nature of his complaint: neither could he afford him any relief. He was induced to consult other physicians in his vicinity, and he did so with like results. In the meantime, a small tumor made its appearance on the under side of his tongue, near or at the seat of pain.

He went to Boston and consulted the late Dr.———, who informed him that his disease was cancer, and gave him but little encouragement as to any permanent relief. He returned to his home, determined to abide the result of what he then supposed an incurable disease. From that time until about the first of February last, he has suffered paroxysms of severe and excruciating pain at different times.

The tumor gradually increased in size, and the paroxysms of pain became more frequent, until it finally became inflamed, suppurated and burst, discharging a small quantity of pus and a calculus weighing fifteen grains, having the general appearances of ordinary renal or biliary calculi. He has since been entirely free from pain.

[*Boston Med. and Surg. Journal.*

## ARTICLE XXVI.

### *On the Action of Hypochlorite of Lime on Sulphur, and the Employment of a Mixture of these Bodies for the Vulcanization of India-Rubber.* By M. GARLTIER DE CLAUBRY. (Comptes Rendus.)

"MR. PARKES, of Birmingham, first made known the curious fact that caoutchouc in contact with very small quantities of chloride of sulphur dissolved in any convenient menstruum, sulphide of carbon, for example, became vulcanized at the ordinary temperature. This process allows of the vulcanization of many objects on which it would be impossible to operate at a high temperature, such as very thin sheets of caoutchouc, or woolen garments, or silk fabrics dyed in colors which cannot resist a great heat. Mr. Parkes also pointed out the precautions necessary when thick pieces are operated upon; but whatever care may be taken, it is easy to see that it is almost impossible to obtain in this way products equally vulcanized.

"Mr. Parkes has pointed out another way by which a better effect is produced, which consists in mixing with the caoutchouc paste what he calls *dry chloride of sulphur*. This name can only be applied to flowers of sulphur impregnated with chlorine, and by means of this mixture india-rubber can really be vulcanized in the cold, and the greater part of the sulphur remain in the state of simple admixture.

"The analysis of a great number of vulcanized objects having revealed the presence of chloride of calcium, it occurred to me that this salt might come from hypochlorite of lime which had been used in the caoutchouc paste to produce the chloride of sulphur necessary for vulcanization, and that it was such a mixture which Mr. Parkes used. The following facts prove beyond doubt that it may be employed for the purpose.

"If we simply shake flowers of sulphur and dry hypochlorite of lime together at the ordinary temperature, the two are scarcely in contact before a strong smell of chloride of sulphur is manifested. If the two be rubbed together in a pestle and mortar, the temperature of the mixture rises, the sulphur becomes soft, and the whole agglutinates into mass with the abundant evolution of vapor. When the sulphur is greatly in excess relatively to the hypochlorite, the mixture of the two bodies should be made without rubbing ; it may then be added to the caoutchouc paste with or without the addition of other substances, such as chalk, zinc white, etc, and the valcanization may be effected either at the ordinary temperature, or at a gentle heat. By this process it is possible to obtain india-rubber of any thickness uniformly vulcanized.

"When sulphur is mixed with a large excess of the hypochlorite of lime by merely shaking the two together, the temperature quickly rises very high and strong action takes place, therefore the mixture must never be made in a close vessel."—*Chemical News.*

# PROCEEDINGS OF SOCIETIES.

## ARTICLE XXVII.

### *Proceedings of the Massachuseetts Medical Society.*

The Annual Meeting of the Massachusetts Medical Society was held in the hall of the Lowell Institute, Boston, on Wednesday, May 30th, 1860, at 10, A. M. The President, Dr. John Homans, in the chair.

After the usual business, Dr. C. C. Holmes, of Milton, offered the following resolution, which was unanimously adopted :—*Resolved*, That a committee of five be appointed to propose what action, if any, is proper, on the part of this Society, respecting the disease now prevailing among the cattle of this commonwealth, and that the committee be instructed to report at the earliest moment practicable. The Chair nominated Drs. H. I. Bowditch, J. Sargent of Worcester, J. G. Metcalf of Mendon, S. Whitney of Framingham, and C. C. Holmes of Milton.

Three communications were then presented :—one upon Neuroma, by Dr. Alfred Hitchcock, of Fitchburg ; another upon the Zymoses of 1859, by Dr. Ephraim Cutter, of Woburn ; and a third upon the subject of Vaccination under the direction of the Middlesex East District Medical Society, by Dr. A. Chapin, of Winchester.

In reference to a memorial presented to the Councillors at the stated meeting in February, 1860, the following resolution was unanimously adopted :—*Resolved*, That the Society assume the payment of the expenses of the several suits brought by Ira Barrows against Drs. B. Carpenter, L. V. Bell and D. H. Storer, and hold the memorialists harmless from all pecuniary liabilities growing out of them.

The committee appointed to consider the subject of the disease now prevailing among cattle, reported the following preamble and resolution, which were unanimously adopted ; Whereas a disease, the nature of which is not well understood, and the treatment of which has been to a remarkable degree unsuccessful, is now prevailing among cattle in this commonwealth, and whereas the Legislature is this day convened to consider this specific object, therefore, *Resolved*, That a committee of nine fron the Mass. Med. Society be appointed by the Chair to urge upon the Legislature the establishment of a scientific commission to investigate said disease. The Chair appointed Drs. J. Bigelow, Geo. Hayward, H. I. Bowditch, and J. B. S.

Jackson, of Boston; O. Martin, of Worcester; J. C. Bartlett, of Chelmsford; J. Gardner, of Pawtucket; C. P. Fiske, of Sturbridge; and J. G. Metcalf, of Mendon.

The Chair nominated the following Committee on Scientific Communications for the ensuing year:—Drs. John G. Metcalf, of Mendon, H. I. Bowditch of Boston, and George Choate of Salem, and they were appointed.

The appointed hour having arrived, Dr. O. W. Holmes delivered the Annual Address. This was upon a subject which has always especially occupied the most active minds of the profession in this city—the use and abuse of drugs. As it is soon to be published, we will not now attempt an analysis of it.

After a vote of thanks to Dr. Holmes for his eloquent and interesting discourse, the Society assembled in Faneuil Hall, where the usual dinner was served. A prayer was offered by the Chaplain, Rev. Rufus Ellis.

On the removal of the cloth, the members were welcomed by the Anniversary Chairman, Dr. D. H. Storer, as follows:—

Welcome, Fellows of the Massachusetts Medical Society. Welcome to this annual festival. Let us forget, for the passing hour, our professional responsibilities, and devote it to social intercourse. Let our meeting be what a meeting of old and tried friends should be, replete with gratitude and hope; *gratitude*, that our beloved Institution should have existed for so long a period, constantly increasing in strength and usefulness; *hope*, that its future career may be more brilliant than its past.

With the history of our Society you must all be familiar—with its early struggles, its gradual growth, its final success. At no previous period have its members been more numerous; never has there existed a more honorable intercourse between them than at the present time. Since our last annual meeting, no pestilence has swept through our ranks; but few are the links which are missed from the chain.

We see the same cheerful contenances—we feel the same cordial grasp, which have heretofore greeted us—and, thank Heaven, he is still spared to us, an exemplar, and councillor and friend, whom we all honor, whom we all love! Joyous, indeed, then, must be our Thanksgiving day! most hearty must be our mutual congratulations!

I would implore *Our Society's continued prosperity*—to attain which no one will feel a greater desire—no one can make a greater effort, than our most faithful, excellent President.

After a few appropriate words from Dr. Homans, the Chairman offered the following:

*The Orator of the Day*—never disappointing, in any intellectual effort, the most sanguine expectations—our community's pride, his friends' idol.

Dr. Holmes responded in his usual happy manner.

The Chairman then said, in the discharge of our everyday professional duties we are constantly needing the services of, we are constantly receiving invaluable aid from our brethren of the other learned professions. A distinguished representative of each of these professions is with us to day. They are each too well-known to require any formal introduction. I will therefore merely recall to your minds and your hearts

*The liberal, faithful Christian gentlemen* who aid us so much in our efforts to relieve suffering humanity—and who, when our efforts are unavailing, strive, by virtue of their office, to prepare the weary spirit for its final home.

This called out the Rev. Mr. Ellis, who alluded to the annual address in a complimentary manner, but remarked that as he listened, the thought occurred to him that the words of the speaker might produce upon some physicians an effect similar to that produced upon clergymen by the advancement of very liberal religious views. He did not believe however, that the doctor was in any real danger from his brother physicians, but would recommend the appointment of a committee whose duty it should be to protect him from the apothecaries. He fully recognized the relation existing between physicians and clergymen, and very aptly remarked that the encouragement of quackery by some of his clerical brethren could only be compared to the action of the deadheads upon a railway train, who showed their appreciation of favors by recommending a rival line.

The following sentiment was then offered :—

*The Sciences of Medicine and Law*—often indispensable together, to established rights which have been alienated, to remove unjust suspicion, to confirm an injured one's innocence or a depraved one's infamy, to determine at what time and by what means a life has been destroyed—to elucidate, in word, what is involved in mystery.

It would have afforded us much pleasure, gentlemen, to have introduced to you upon this occasion, the eminent legal adviser, who, during the entire last decade of your history, has held himself ready at all times to protect your interests and defend your honor ; but paramount duties have controlled him, and he remains at his post in the Capitol of our Republic, one of the ablest advocates of the rights of man—I refer to that accomplished lawyer and honest man, Thomas D. Elliott, of New Bedford. We are honored to-day by the presence of Chief Justice Shaw, of whom it has been well said by a distinguished member of the bar, "the high station which he occupies has been filled by him as none other has filled it, as none other in our day can."

This was responded to by Chief Justice Shaw, who acknowledged in a most feeling manner his cordial reception, and paid a warm tribute to the medical men whose testimony is so often essential in courts of justice.

The following was responded to by Dr. Fiske, of Fiskdale.

*The sagacious, judicious, upright country practitioner*—the most welcome guest in every family within his circuit: The most valuable, the most valued member of the community in which he lives.

He spoke as representing country practitioners, and showed, in his own person, that they are in every way able to speak for themselves.

The following called out Dr. Jacob Bigelow.

*The rational physician*—who knows that all real science is based upon the unvarying laws of Nature—that if Truth is sought for, her dictates alone must be followed.

We regret very much that we cannot give the remarks of those gentlemen who responded to the following sentiments from the Chairman.

*The genial, sympathizing, warm-hearted Doctor*—whose very presence in the sick chamber is sunshine, and whose kind and faithful attentions are the most effectual balm.

Responded to by Dr. Reynolds.

Great as has been the light shed upon the subject of medical jurisprudence during the last quarter of a century, the student proudly claims for America, its most vivifying Ray.

Dr. Ray being absent, answered through Dr. U. Parsons, of Providence, R. I.

We see before us to-day, one who has been in labor for more than fifty years; protracted, tedious, however may have been his travail, he exhibits no symptoms of *nervous exhaustion*, he presents no appearance of *puerperal mania*, but displays the same vivacity and other peculiarities which characterized him when we listened to his instructions thirty-five years ago. We rejoice to see him here, to know that he still labors, well.

Dr. Channing replied.

Our brethern throughout the length and breadth of the land, who are devoting their lives to the amelioration of the condition of the insane. Holy is their mission. Most nobly is it being performed. Let us, as one man, God speed them in their work.

This was responded to by Dr. Walker of South Boston.

*Professional integrity*—never more strikingly illustrated than by his career, which prompted one of our keenest members, when advisng a young man just entering upon the duties of life, to concentrate all he considered necessary to say, in the single word be *Ware*.

Dr. Ware being absent, this was replied to by Dr. Gardner of Pawtucket.

We have just learned that a gentleman is with us, sent as a delegate to our meeting by the Connecticut Medical Society. In your name, I would offer him a cordial welcome.

To which happy sentiment Dr. Noyes responded.

DR. HOLMES' ADDRESS.—As the Address deliverd by Dr. Holmes last week, has been variously and erroneously reported in some of the public papers, the attention of our readers is directed to the following note on the subject from Dr. H.:

MESSRS. EDITORS,—I beg leave to say that I prepared an abstract of my address before the Mass. Medical Society for the Boston [daily] Journal, and disclaim all responsibility for opinions attributed to me in any other report of the Address. Yours, very truly,

O. W. HOLMES.

*June 4th*, 1860.

# EDITORIAL DEPARTMENT.

*Dental Education.*—Much discussion has been excited by the various schemes of dental education which have been submitted for the consideration of the profession. Not only this country but England has been divided in sentiment upon this subject, and varying opinions have given rise to diversity of practice. It seems, however, that two dominant ideas of the objects of this education lie at the basis of this multiform disagreement.

There are those who believe that the sole education necessary is a practical training, and they are loud in their commendations of the *practical* as opposed to the *theoretical.* Now, none but a fool will underrate the importance of practical training; the only question is, what shall be considered practical training?

The crude notion of it is that sort of exercise of the hands and eyes which gives steadiness to the one and discernment to the other. It is a mechanical facility which is arrived at, a mere handicraft accuracy which is assured. If the hand be expert to do all it has been taught to do, if the eye is able to recognize all that it has been in the habit of seeing, the training is considered complete. A man reduced to the condition of an automaton which perfectly performs its assigned work upon the application of the foreordained stimulus, is the highest development of this practical training. To our minds, this is not the only desirable achievement of education.

A more lamentably one-sided and imperfect being than the strictly *practical* man is not conceivable by the human mind. He is a man who has traveled perpetually one beaten track, till like the blind mill horse, it is impossible for him to miss it. He would go through all the motions of a given operation with his eyes shut and his mind closed also. His ideas, when he has any, are a mere collection of formulæ. They run in grooves, channeled in his brain, and cannot get out of their accustomed track. Mentally, as well as physically, he has become a machine. The result is, that so long as the old combinations recur in the familiar order, he is a model of manual excellence. The number of times the same motions have been performed, have given a precision to the muscles worthy of commendation, but have left the mind a blank. When new combinations present themselves, the mere *practical* man is completely adrift, without compass or rudder. Never having been in the habit of reasoning upon the phenomena he has witnessed, he is unable to meet any new arrangement of the old appearances, still less to deal with new facts. He stands aghast and bewildered at the unexpected state of affairs, or tries to apply one of his old formulæ, which is utterly inapplicable.

The other idea of education is that which inculcates the necessity of providing the student with principles thoroughly expounded and satisfactorily demonstrated. He is thus armed in advance to meet difficulties. He applies the principles he has acquired to individual cases as they arise. Accustomed to analyse complex phenomena and reduce them to their simplest elements, he is not bewildered by new combinations. The old elements are all present, but under a new form. He appreciates the new arrangement, because familiar with the old, not as a simple but as a compound being: or if a new element is present, he immediately recognizes it because he is already familiar with the old.

The question at issue between the two parties is simply this: Shall dentistry be a manual *art* or shall it be a profession, a branch of the great profession of medicine? If the former, let the practical training be adopted, not, however without the inculcation of principles, for no man who thinks can do anything without a theory. If the latter view be adopted, then let the dentist be so grounded in the fundamental principles of medicine, that he may be able to take his position among medical specialists, and let him be so thoroughly versed in the science of his own specialty, that medical men generally will be compelled to refer to him for what information they may need, not only upon the art but also upon the science of his department.

*Currents and Counter Currents in Medical Science.*—The Annual Address to the Massachusetts Medical Society, by Dr. O. W. Holmes.

Dr. Holmes has rarely written anything which is not worthy a most attentive perusal. Clear, elegant and forcible in his style, he presents his wise and witty thoughts to us in an eminently attractive form. The pamphlet before us is no exception to the general character of the Doctor's works. It is a bold and somewhat radical statement of the doctrines of the *natura duce* school of medical reformers. Following in the footsteps of the celebrated Forbes, Dr. Holmes vehemently inveighs against the old system of pharmacolatry. Not unwisely did the old Greeks use the same word to denote a drug and a poison, and in this address the witty Doctor adopts and expounds the notion hidden under this curious old synonym. So broad and absolute, however, is his denunciation of polypharmacy, that his brethren in the Association were not prepared to follow him, and have cautiously prefixed to the pamphlet a copy of a resolution passed by them, disclaiming all responsibility for the sentiments of the address. We strongly commend the pamphlet to the notice of our readers.

*Arsenic Poisoning and Arsenic Eating.*—Arsenic appears to be fast becoming an ubiquitous poison. Little children swallow it in their delicate green bon-bons; women encircle themselves with robes tinted with its beautiful hues, and waft danger around their lovely persons, *killing* their admirers literally as well as metaphysically; painters spread it over their canvass; paper hangers captivate their customers with its charming colors. We can hardly turn without meeting this poison in some form or other.

When it was first announced that paper hangings colored green by arsenite of copper were dangerous to health, the paper hangers took the alarm at the prospective damage to their trade, and secured the services of eminent chemists to look into the question of danger to life and health. These scientific gentlemen put green paper into test tubes, with and without currents of air, and found that no moderate heat, not even that of boiling water, was capable of volatilizing the arsenite of copper. They also looked into the question of putrefying paste, and found that its emanations passing through the paper did not give rise to the formation of arseniuretted hydrogen. They therefore concluded that as in none of these ways arsenic could be volatilized, it was perfectly fixed, could not mix with the air of the apartment, and therefore, that the green paper was entirely innocuous.

Strange to say, in all their speculations, these learned gentlemen entirely overlooked the humble but potent agency of Bridget. When that high domestic functionary, intent upon cleanliness and the extermination of spiders, enters an apartment, armed with her irresistible brush, she sweeps from the surface of the paper the imperfectly adherent green powder, which from its extreme fineness floats in the atmosphere of the room, and when it does settle on book, and chair, and carpet, is so easily raised that it may be considered to be constantly present in the air when any one is moving about the room. In this way it gets access to the lungs and other air-passages, and even through the saliva to the digestive organs. Thus a slow poisoning is set up, which manifests itself by the usual symptoms. The fact that such poisoning does take place has been established by a great mass of concurrent testimony so pointed and direct that it is impossible to doubt it.

Shortly before public attention had been drawn to this matter of the paper hangings, some curious statements had been made relative to the innocuousness of this very poison in certain constitutions accustomed to its use. In all these cases the poison was eaten habitually. So remarkable a statement gained extensive currency and was alternately doubted and believed. At last a counter statement was made, the whole story was ridiculed, and it was settled that Styrians could no more eat arsenic with impunity than other people. The matter was believed by many to be finally set at rest, and Styrian arsenic eating was credited to the general account of traveler's tales.

Recently, however, Mr. Charles Heisch, lecturer on chemistry at the Middlesex Hospital, has published in the *Pharmaceutical Journal* a paper on this subject, which we copy. It will be observed that he believes the original statement about the arsenic eating, and cites authorities to prove it. Among other interesting points in the article, we call attention to the greater danger of inhalation over the introduction of the poison into the stomach.

## THE ARSENIC EATERS OF STYRIA.

By Chas. Heisch, Lecturer on Chemistry at Middlesex Hospital.

At the last meeting of the Manchester Philosophical Society, I observe that Dr. Roscoe called attention to the arsenic eaters of Styria. Having for the last two years been in communication with the medical men and other residents in the districts where this practice prevails, I shall feel obliged if you will allow me through your journal to make known the facts I have at present collected. The information is derived mainly from Dr. Lorenz, Imperial Professor of Natural History, formerly of Salzburg, from Dr. Carle Arbele, Professor of Anatomy in Salzburg, and Dr. Kottowitz, of Neuhaus, besides several non-medical friends. If human testimony be worth anything, the fact of the existence of arsenic eaters is placed beyond a doubt. Dr. Lorenz, to whom questions were first addressed, at once stated that he was aware of the practice, but added, that it is generally difficult to get hold of individual cases, as the obtaining of arsenic without a doctor's certificate is contrary to law, and those who do so are very anxious to conceal the fact, particularly from medical men and priests. Dr. Lorenz was, however, well acquainted with one gentleman, an arsenic eater, with whom he kindly put me in communication, and to whom I shall refer again more particularly. He also says that he knows arsenic is commonly taken by the peasants in Styria, the Tyrol, and the Salzkommergut, principally by huntsmen and woodcutters, to improve their wind and prevent fatigue. He gives the following particulars:

The arsenic is taken pure in some warm liquid, as coffee, fasting, beginning with a bit the size of a pin's head, and increasing to that of a pea. The complexion and general appearance are much improved, and the parties using it seldom look as old as they really are; but he has never heard of any case in which it was used to improve personal beauty, though he cannot say that it never is so used. The first dose is always followed by slight symptoms of poisoning, such as burning pain in the stomach, and sickness, but not very severe.

Once begun, it can only be left off by very gradually diminishing the daily dose, as a sudden cessation causes sickness, burning pains in the stomach, and other symptoms of poisoning, very speedily followed by death.

As a rule, arsenic eaters are very long lived, and are peculiarly exempt from infectious diseases, fevers, &c.; but unless they gradually give up the practice, invariably die sudden at last.

In some arsenic works near Salzburg with which he is acquainted, he says the only men who can stand the work for any time are those who swallow daily doses of arsenic, the fumes, &c., soon killing the others. The director of these works, the gentleman before alluded to, sent me the following particulars of his own case. (This gentleman's name I suppress, as he writes that he does not wish the only thing known about him in England to be the fact that he is an arsenic eater; but if any judicial inquiry should arise which might render positive evidence of arsenic eating necessary, his name and testimony will be forthcoming.)

"At 17 years of age, while studying assaying, I had much to do with arsenic, and was advised by my teacher, M. Bönsch, Professor of Chemistry and Mineralogy at Eisleben, to begin the habit of arsenic eating. I quote the precise words he addressed to me: 'If you wish to continue the study of assaying, and become hereafter superintendent of a factory, more especially of an arsenic factory, in which position there are so few and which is abandoned by so many, and to preserve yourself from the fumes which injure the lungs of most, if not of all, and to continue to enjoy your customary health and spirits, and to attain a tolerably advanced age, I advise you—nay, it is absolusely necessary, that besides strictly abstaining from spirituous liquors, you should learn to take arsenic; but do not forget, when you have attained the age of 50 years, gradually to decrease your dose, till from the dose to which you have been accustomed, you return to that with which you began, or even less.' I have made trial of my preceptor's prescriptions till now, the 45th year of my age. The dose with which I began, and that which I take at present, I enclose; they are taken once a day, early, in any warm liquid, such as coffee, but not in any spirituous liquors." The doses sent were No. 1, original dose, three grains; No. 2, present dose, twenty-three grains of pure white arsenic in coarse powder. Dr. Arbele says this gentleman's daily dose has been weighed there also, and found as above. Mr.—— continues:—"About an hour after taking my first dose (I took the same quantity daily for three months,) there followed slight perspiration with griping pains in the bowels, and after three or four hours a loose evacuation; this was followed by a keen appetite, and a feeling of excitement. With the exception of the pain, the same symptoms follow every increase of the dose. I subjoin as a caution, that it is not advisable to begin arsenic eating before the age of twelve, or after thirty years." In reply to my question, if any harm results from either interrupting or altogether discontinuing the practice, he replies. "Evil consequences only ensue from a long continued interruption. From circumstances I am often obliged to leave it off for two or three days, and I feel only slight languor and loss of appetite, and I resume the arsenic in somewhat smaller doses. On two occasions, at the earnest solicitations of my friends, I attempted entirely to leave off the arsenic. The second time was in January, 1855. I was induced to try it a second time, from a belief that my first illness might have arisen from some other cause. On the third day of the second week, after leaving off the dose, I was attacked with faintness, depression of spirits, mental weakness, and a total loss of the little appetite I still had; sleep also entirely deserted me. On the fourth day I had violent palpitation of the heart, accompanied by profuse perspiration. Inflammation of the lungs followed, and I was laid up for nine weeks, the same as on the first occasion of leaving off the arsenic. Had I not been bled, I should most likely have died of apoplexy. As a restorative, I resumed the arsenic eating in smaller doses, and with the firm determination never again to be seduced into leaving it off, except as originally directed by my preceptor. The results on both occasions were precisely the same, and death would certainly have ensued had I not resumed the arsenic eating." One of the most remarkable points in this narrative is, that this gentleman *began* with a dose which we should consider poisonous. This is the only case of which I have been able to obtain such full particulars, but several others have been mentioned to me by those who knew the parties, and can vouch for their truth, which I will briefly relate.

One gentleman, besides stating that he is well aware of the existence of the practice, says he is well acquainted with a brewer in Klagenfurth, who has taken daily doses of arsenic for many years. He is now past middle life, but astonishes every one by his fresh, juvenile appearance; he is always exhorting other people to follow his example, and says, "see how strong and fresh I am, and what an advantage I have over you all! In times of epidemic fever or cholera, what a fright you are in, while I feel sure of never taking infection."

Dr. Arbele writes: "Mr. Curator Kursinger (I presume curator of some museum at Salzsburg,) notwithstanding his long professional work at Lungau and Binzgau, knew only two arsenic eaters—one the gentleman whose case has just been related, the other the ranger of the hunting district in Grossarl, named Trauner. This man was at the advanced age of 81, still a keen chamois hunter, and an active climber of mountains; he met his death by a fall from a mountain height while engaged in his occupation.

Mr. Kursinger says he always seemed very healthy, and every evening regularly, after remaining a little too long over his glass, he took a dose of arsenic, which enabled him to get up the next morning perfectly sober and quite bright. Professor Fenzl. of Vienna, was acquainted with this man, and made a statement before some learned society concerning him, a notice of which Mr. Kursinger saw in the *Wiener Zeitung;* but I have not been able to find the statement itself. Mr. Krum, the pharmaceutist here, tells me that there is in Stursburg a well-known arsenic eater, Mr. Schmid, who now takes daily twelve, and sometimes fifteen grains of arsenic. He began taking arsenic from curiosity, and appears very healthy, but always becomes sickly and falls away if he attempts to leave it off. The director of the arsenic factory before alluded to, is also said to be very healthy, and not to look so old as 45, which he really is.

As a proof how much secresy is observed by those who practice arsenic eating, I may mention that Dr Arbele says he inquired of four medical men, well acquainted with the people of the districts in question. both in the towns and country, and they could not tell him of any individual case, but knew of the custom only by report.

Two criminal cases have been mentioned to me, in which the known habit of arsenic eating was successfully pleaded in favor of the accused. The first by Dr. Kottowitz, of Neuhaus, was that of a girl taken up in that neighborhood on strong suspicion of having poisoned one or more people with arsenic, and though circumstances were strongly against her, yet the systematic arsenic eating in the district was pleaded so successfully in her favor that she was acquitted, and still lives near Neuhaus, but is believed by every one to be guilty. The other case was mentioned by Dr. Lorenz. A woman was accused of poisoning her husband, but brought such clear proof that he was an arsenic eater, as fully to account for arsenic being found in the body. She was, of course, acquitted.

One fact mentioned to me by some friends is well worthy of note. They say:—"In this part of the world, when a graveyard is full, it is shut up for about twelve years, when all the graves which are not private property by purchase, are dug up, the bones collected in the charnel-house, the ground ploughed over and burying begins again. On these occasions, the bodies of arsenic eaters are found almost unchanged, and recognizable by their friends. Many people suppose that the finding of their bodies is the origin of the story of the vampire." In the *Medicinischer Jahrbuch des Oster: Kaiserstaates*, 1822, *neuest Folge,* there is a report by Professor Schallgruber, of the Imperial Lyceum at Grätz, of an investigation undertaken by order of Government in various cases of poisoning by arsenic. After giving details of six *post-mortem* examinations, he says:—"The reason of the frequency of these sad cases appears to me to be the familiarity with arsenic which exists in our country, particularly in the higher parts. There is hardly a district in Upper Styria where you will not find arsenic in at least one house, under the name of hydrach. They use it for the complaints of domestic animals, to kill vermin, and as a stomachic to excite an appetite. I saw one peasant show another on the point of a knife how much arsenic he took daily, without which, he said, he could not live; the quantity I should estimate at two grains. It is said, but this I will not answer for, that in that part of the country this poison is used in making cheese; and, in fact, several cases of poisoning by cheese have occurred in Upper Styria, one not long since. The above-mentioned peasant states, I believe truly, that they buy the arsenic from the Tyrolese, who bring into the country, spirits and other medicines, and so are the cause of much mischief." This report is, I believe, mentioned in Orfila's *Toxicology*, and one or two other works, but I have not seen it quoted myself; it is interesting, as being early and official evidence of arsenic eating. Since I received the above information, a gentleman who was studying at this hospital, told me that, when an assistant in Lincolnshire, he knew a man who began taking arsenic for some skin disease, and gradually increased the dose to five grains daily. He said he himself had supplied him with this dose daily for a long time. He wrote to the medical man with whom he was assistant, and I have been for a long time promised full particulars of the case; but beyond the fact that he took five grains of arsenic, in the form of Fowler's solution, daily, for about six years, and could never leave it off without inconvenience, and a return of his old complaint, I have as yet not received them. I have delayed publishing these facts for some time, hoping to get information on some other points, for which I have written to my friends abroad; but as considerable delay takes place in all communications with them, I have thought it better to publish at once the information I have already received. All the parties spoken of, are people on whom the fullest reliance can be placed, and who have taken much pains to ascertain the foregoing particulars. The questions which still remain unanswered, are these:

1st. Can any official report be obtained of the trials of the two people mentioned by Drs. Kottowitz and Lorenz?

2d. Do medical men in these districts, when using arsenic medicinally, find the same cumulative effects as we experience here? Or is there anything in the air or mode of living which prevents it?

3d. Can any evidence be obtained as to how much of the arsenic taken is excreted? To show whether the body gradually becomes capable of enduring its presence, or whether it acquires the power of throwing it off.

I have proposed to the gentleman who furnished me with the particulars of his own case, either to make an estimate of the arsenic contained in his own urine and fæces during twenty-four hours, or to collect the same and forward them to me that I may do so, but as yet have received no answer.

*Apology.*—Owing to the serious illness of one of the editors, and the protracted absence from the city of the other, we have not been able to secure our usual variety. Accident has prevented the continuation of the translation of St. Claire-Deville's article on platinum. Its publication will, however, be resumed in the October number.

*New Medical Journal.*—We have received the first number of the *American Medical Times,* edited by Dr. Stephen Smith, with whom are associated Drs. Elisha Harris and George F. Shrady. In its general appearance it is equal to the best London weeklies, and reflects great credit upon all concerned. We are glad to find such full reports from the various New York Hospitals.

*The Journal de Chimie Medicale* contains an account of the discovery of a new and powerful sedative in neuralgia, just discovered by Dr. Field. The substance used is nitrate of oxyd of glycile, and is obtained by treating glycerine at a low temperature with sulphuric or nitric acid. One drop mixed with ninety-nine drops of spirits of wine constitutes the first dilution. It has been tried upon animals and patients with remarkable effect. A case of neuralgia, in an old lady, which had resisted every known remedy, was completely cured by this new agent. It has also been tried in dental neuralgia with equal success.

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# ORIGINAL COMMUNICATIONS.

## ARTICLE I.

## *Tobacco—its Effects upon the General Health, and its Influence upon the Teeth.*

We have been induced to offer the present article as much to present some interesting facts which have recently appeared in treatises upon the subject, from which we shall borrow largely, as to advance the idea that it is in some cases preservative of the teeth.

We are no apologist for the filthy abuse in the use of the weed, but advocate the position of judging of it, according to its analytical qualities and their effects upon the system, not screening the great social misdemeanor of which it is too often the disgusting evidence. Kingsley is nearly right when he says "man is a smoking animal," for it especially signalises him from all other animals, for about three centuries has it been gaining ground until all civilized nations use it extravagantly, and many of the uncivilized and barbarous do likewise.

It will be useful to our purpose to know by figures how general this use is, so as to draw a conclusion of its vital effects. A writer states that "the tobacco zone girdles the globe." From the equator through fifty degrees of latitude, it grows and is consumed on every continent. All classes, all ages, in all climates, and in some countries both sexes, use tobacco to dispel heat, to resist cold, to soothe to reverie, or to arouse the brain. In Great Britain 17 ounces per head, France 18½, Denmark 70, Belgium 73½, New South Wales 14 lbs., and supposed to be much greater in some of the States of North America. The average for the whole human race of one thousand millions has been reasonably set at seventy ounces per head, or two millions of tons, requiring five and a half million acres of rich lands to produce it, of this the United States alone raised in 1850 two hundred million pounds, at the same time importing eighty-two million pounds from Turkey, Germany and Cuba, giving about three pounds eight ounces per head to our population.

These figures, we think, with the writer, must lead us to conclude that it cannot be so deleterious to the body and mind as the anti-tobacconist would lead us to believe, "or whole nations would have been extinguished under its use." Many mighty ones have used it for centuries and show no aggregated deterioration, individual exceptions being allowed, arising from idiosyncrasy or beastly excess, having no weight in the argument, nor will we ponder to moralize upon the cause inducing man to resort to narcotic stimulants, or any other of his characteristic habits, suffice it that he is beyond all other creatures, the tobacco consumer, our object being to find if this is necessarily injurious, if statistical facts prove that it is destructive to the race, either physically or mentally.

In the first place we start with the proposition that the intellectual condition of certain leading nations is greater than at any previous period, and to all observations making more rapid and powerful advances at this time than at any previous period of their history. We will cite North America, England, France, Germany, Prussia, Belgium, &c., as examples. The records of longevity in these different nations, although in certain localities showing great fluctuation, in the aggregate establish the fact, that the term of life is gradually being prolonged. Instead of any of our most enlightened nations stagnating or deteriorating, they are steadily advancing towards an improved condition of health, proven by the average life of man being greater, at the same time we have the coincidence of an enormously increasing use of tobacco, increase of size, weight, strength and endurance.

All European travelers unite in stating that the armor worn by the ancient as well as more modern warriors, would be much too small for the average men of the present day. The celebrated Black Prince must have been a man whose stature was five feet eight, and weight of about one hundred and forty pounds, less than the generality of men of our times. Of this the writer is confident, having examined the breast-plate, casque and shield critically, as well as many other well known genuine suits, most bearing conclusive evidence of this fact.

The recent wars in different parts of the world show no decrease in man's power of bodily endurance, as may be instanced in the Crimea, as well as in India, where hunger and fatigue were borne by masses of men almost unequalled; where often the only full supply of wants was in tobacco, which proved a sufficient support until more material aid was found. So too in our recent Rocky Mountain expedition, where it proved of the greatest importance and was missed more than the expenditure of any other supply, until a temporary substitute was had in the dried bark of the willow.

We must presume that these points will be conceded—that greater progress has been made coincident with the increasing use of tobacco, by nations who use it most extensively. We therefore have no evidence to prove that it has had a deteriorating result, whilst it may be more reasonable to infer that it may have had a rather good than a bad effect, from the fact of these acknowledged improvements occurring during its greatest use.

Little is hazarded in saying that the great majority of our men of science, art and literature, have indulged in the use of tobacco more or less extensively, many performing their best labors under its enjoyment, and judging from our personal observation, tobacco users live to a ripe old age.

We will now glean from various published documents its chemical characteristics, in the hope of discovering what the true nature of this remarkable plant is. The active matter of the leaves is found to be resident in a volatile alkali *nicotin*, and a volatile oil *nicotianin*, a third is eliminated under great heat, *empyreumatic oil*, these are the active principles involved in inert matters found in most vegetable formations, as starch, gum, albumen, resin, lignin, with the organic acids in varying proportions as is the case in other plants. The inorganic salts predominate in tobacco as those of lime, potassa, ammonia, &c., as do highly nitrogenized substances, making it one of the most exhausting of crops.

Orfila says that *nicotin** has the greatest power to resist decomposition in the decaying tissues of the body, it being found in animals destroyed by it months after their death. It exists in greater or less proportions in all tobacco, but is generally very small in quantity, is a most active poison, odorless, an acrid and burning taste, as found in the plant is not volatile, and in treatment alkaline. The latter tobacco has least in quantity, ranging in the mild from two per cent. to eight in the rankest.

*Nicotianin* as it exists in tobacco, is a mere fact of the laboratory as well as the alkaloid just noticed, except in smoking, for ordinary chewing does not exhibit it to any degree, except that the peculiar smell is thought to be attributable to the volatile oil of which we are now treating. It constitutes but a very slight proportion, for even by distillation one pound yields but two grains, being one half of one per cent., age supposed to increase this quantity. When inhaled or smelt, it produces sneezing, but taken as medicine in sufficient doses excites vomiting and giddiness, both of these principles are active constituents of tobacco, *nicotin* predominating, and is perhaps much the most important, it being almost impossible to inhale any proportion of its fumes, a single drop destroying any small animal, whilst one grain has been taken of nicotianin with impunity.

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*It has recently been proposed as an antidote for strychnine.

It is difficult to imagine the third constituent of tobacco, empyreumatic oil, even by experiment, as separate and distinct from the two first principles, it being an oil like nicotianin, which is comparatively inoperative, but involved with a base of strong narcotic poison, which is destroyed by washing the oil with nitric acid, showing its affinity to the base nicotin, both losing their narcotic, poisonous character by treatment with this acid. Indeed the two former most probably can be found in this oil, which is produced by combustion in partly closed vessels, as the common pipe, and is the coloring material of the German meerschaum clay. The writer from whom we have borrowed so freely says, nicotianin from its feebler action and small amount, is not a very efficient principle in producing the narcotic effects of tobacco, and that the empyreumatic oil consists only of fatty matters holding the alkali in solution. We are forced to believe that the only constituent worthy of much attention, as the essence of the plant, is the organic base, nicotin or nicotiá.

The great question to be solved is, how much of this is absorbed into the system in its uses, and if absorbed, how does it act, for after all we must judge by the effects produced. In smoking, the heat is but sufficient to volatilize a perceptible portion, which is either ejected, or the mouth protects itself by its secretions, and of the supposed *two* per cent., scarcely a part could be absorbed without the usual symptoms attendant upon its exhibition, and which is only apparent as long as the system has not protected itself against its attack, as in its early use, when all of its injurious effects are no doubt made particularly evident.

The abuse of the most wholesome aliment is attended with injurious consequences, the most appropriate remedy pushed too far becomes a deadly poison at times, and tobacco as vulgarly used may be equally pernicious. But if this is so dreadful a poison its almost universal use should enable us to determine its exact action, and see its results immediately, as in all other similar conditions of slow poisonings, as it is claimed to be.

The opium eater gives indubitable signs of approaching decay at an invariable early age, besides having a peculiar bodily indication of his habit, as well as mental hallucination, so with hatchis, so with intemperate drinking, but tobacco is the regular companion of most of our old men and is not commonly attended with any physical change or appearance except it be in individual cases and in its beastly use. Mankind universally indulge in fruit and other food from which chemistry enables us to distil fearfully rapid poisons, and judging these by the results of their analysis, we would be all slowly but certainly destroying ourselves. Common salt contains the deadliest vapor chlorine, yet from experience who would denounce its use, indeed is it not imperatively demanded by the instinct of all animals? Most fruit contain more or less of prussic acid, a poison quite as active as nicotin, the former more abundantly found in the peach, plum and some nuts, than the latter is in tobacco, yet the imagination of man has not yet attacked these luxuries, as they only come occasionally and are universal indulgences.

No fact is more clear to the true chemist than that the results of his analysis is one thing and that of its chemical appropriation quite another, so that it is neither safe nor reliable to compare the two products. Nature appropriates or rejects the elements brought in contact, by bringing to bear elements and forces quite inscrutable and unknown, often changing instantly the destructive matter into the inert or useful, so that we are ever driven, in such questions, to seek for the known physiological effects from which to form our opinions. Here we take issue with the opposition, and claim that the positive proof of the injurious effects of tobacco is wanting, except in some few exceptional cases, which prove nothing.

The immense indulgence of tobacco must, if injurious, be capable of abundant evidence, and this has never been fairly or fully shown. The mere fact of a man dying who used tobacco, or of a development of cancerous growth in the mouth, prove as well, in the first instance, that death ensued because a sufficient quantity was not used, and in the second place that an hereditary cachexia had been developed by an incident not at all connected with the cause. This wide spread instinct must have solid and undeniable proof to check its wonderful increase, not its mere denouncement, for there is a singular inclination to believe in the beneficence of some luxuries and pleasures the temperate enjoyment of which man so eagerly, and we say, so harmlessly finds comfort in.

The only fact established worthy of consideration, is the waste of the secretions of the mouth, which is said to produce derangement of the digestion. That a large amount of the saliva is thus wasted and if no compensation is made by the system for this loss, injury must inevitably result, but that indigestion follows as a necessary consequence is by no means proven, for the most frequent sufferers from indigestion are women who never use tobacco, nor has our observation established the fact that tobacco users are more liable to this malady than others.

We are compelled to think that the system compensates for this waste of the saliva by increasing the amount of the secretion, experiment establishing the fact that its quantity does not deteriorate the quality, if one pound and a half is the common quantity secreted, three times this weight can be produced without deranging its office in the stomach, a quantity quite sufficient to supply the wants of the system, and the most abandoned use of tobacco.

Physiology determines the use of this secretion to be two-fold, first, the moistening of food, and secondly, the conversion of farinaceous substances into sugar, and as this is so essential a feature in digestion, nature has supplied a reserve force in the *pancreas*, which has been determined by Kölliker and others to secrete an exactly similar fluid which is discharged upon the food just after it leaves the stomach, so that if any starchy matters have failed to become sufficiently saccharine for suitable appropriation, this gland supplies the want, and like all other glands is capable of increasing its usual supply to a sufficient extent.

Food is the natural stimulant of the salivary secretions, they are also excited by any mechanical substance placed in the mouth, tobacco is however the direct stimulant of these glands, and must be regarded not as the source of injury in its use, for the power of the system to fully supply an almost unlimited demand, is abundantly established by experiment. An apparent exhaustion by any artificial means will be at once corrected by a resort to the natural excitant, food, of almost any savory kind, showing that nature has power to reserve this secretion for natural demands. The injurious effects of tobacco must be found to attack some other function than that of the salivary secretion, and this has been supposed to be in its action upon the nervous system.

This vague and indefinite charge like the others against the use of this plant, is quite out of the domain of positive proof. Reasoning by analogies however, we are induced to draw rather a favorable hypothesis of its action upon the system, not forgetting that there are many idiosyncrasies quite incompatible with any habit out of the ordinary economy of nature.

Tobacco acts generally as an excitant and is an active stimulant to the nerves of sensation and emotion, thus its pleasurable effects are derived. It stimulates the brain proper, and until habit has modified its action, is followed by a depressing influence, which eventually becomes by continued use of a sedative character, lulling and soothing to the individual. It certainly has no direct action upon the sympathetic system of nerves, except when swallowed or used medicinally, and then it acts as a powerful revulsive.

As usual its action must be promotive of bodily comfort, reasoning from the laws of general health. In digestion its consequences must be, if any, in the stomach, by depriving it of the salivary secretion of the mouth, whilst the food is in this cavity, but when once the aliment has entered the stomach the availability of the secretion is prohibited by dilution and absence of contact. Digestion must proceed according to the powers of the stomach, and suitable appropriation take place according to the perfection of this process and the assimilating power of the system. Now all influences disturbing these processes act injuriously by diverting the concentration of vital action from the stomach and assimilative organs, and that which will remove any obstruction to digestion must necessarily allow a fuller action by removing impediments more or less great. Tobacco, therefore, in its sedative and narcotic influence upon the emotions and brain proper, relieves digestion of diverting influences, having similar tendencies as sleep, which allows all the vital force of the body to concentrate itself in the great work of digestion.

Opium acts very differently by first narcotising and then irritating, acting as well upon the sympathetic nerve as upon the brain, exhausting and paralyzing in its ultimate effect.

Too many are accustomed to class the two as similar evils, attributing all sorts of morbid consequences alike to their use. The brain under opium is not soothed or lulled into rest, it is simply benumbed, partially paralyzed, and has often a fearful reaction, deranges the secretions by suspending some and over stimulating others, operating through the nervous system upon the whole animal economy, whilst tobacco is incapable of any of these, exciting at first, but generally soothing and quieting in its permanent effect. In far the majority of persons that tobacco may be said to injure, there will be found a constitutional debility with habits and occupations, increasing this natural tendency, and thus inherited and acquired evils are mostly charged upon tobacco, when at worst it may have only added to an unavoidable decay, for these same conditions are as frequently found in persons who do not use it in any manner, as in those who do. Indeed we venture little in asserting that among women, who cannot be said to use tobacco, that there will be found as much impaired nutrition, more indigestion and derangement of the various secretions, of the nervous system, and especially of the liver, than can be found among chewers or smokers. Of course this is a mere assertion, but is it not the proverbial observation, and does not the practice of medicine indubitably point to woman as those most frequently demanding the aid of the physician?

It must be borne in mind that we are not advocating that tobacco is in all cases harmless, for we admit that its excessive use is always more or less injurious, productive of minor evils, principally perhaps of the nervous system, but claim that it seldom runs into the course of grave disease, as no well authenticated case of death has been proven attributable to it. Its moderate use by individuals of no particular proclivity to disease, must be recognized as inoffensive, but to invalids and those of peculiar idiosyncrasies all habits are injurious that produce any disturbance, except those of a curative character. Prof. Christison affirms this position by saying, "no well ascertained ill effects have been shown to result from the habitual practice of smoking," much the most questionable form in which tobacco can be used. Beck states that "common observation settles the question, that the moderate and daily use of tobacco does not prove injurious, and this is the general rule," exceptions necessarily exist. Critical inquiry will establish beyond cavil, that the use of the plant is much less injurious than all other narcotics, opium, Indian hemp, the betel and the hop, have all distinct and positive evils in their train,* whilst tobacco has had simply vague charges of serious disease without proof or substantiation.

We are not forgetting that the Turk is perhaps the most abandoned user, as well as the most retrograding of civilized man, but all enlightened judgment will trace this to more radical causes than this simple habit. His geographical position, climate, religion, social and political government, all proclaim him to be the victim of destiny, and the progenitor of increasing moral and physical infirmity.

That tobacco is preservative of the teeth is by far the easiest of proof. The teeth decay principally from long contact with matters found in the mouth, whether it be acids, alkalies, or putrescent substances: it requires the action of one or all of these for a continued length of time to produce decay, so much so, that this would fail to produce this effect, did not the mechanical form of the teeth aid this result through the indentations, fractures and fissures in the enamel, admitting these destructive agents into the interior of the tooth, where the operation of exchange of elements takes place by a slow but unobstructed process.

Often the health of the mouth has really little to do with the decay of the teeth, for the gums and the various secretions may have been perfectly healthy, but from the form of the teeth admitting fluids to come in contact with the dentine, and there remaining until their destructive character is completed, when decomposition of the bone must go on until these causes are removed.

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*Christison reports the observations of MM. Parent, Duchatelet and D'Arcet, "among four thousand workmen in the tobacco manufactories of France, that they found no evidence of its being unwholesome."

The greatest source of caries in the teeth, however, is found in the unhealthy condition of the fluids of the mouth and the want of absolute cleanliness, in order that these corroding agents may be entirely removed, and any procedure which will accomplish this end will effectually avoid the consequences with the previous exception considered. We believe the most visionary anti-nicotianist has never supposed that tobacco diseased the glands of the mouth, and we have shown that the quality of the salivary secretions is not altered in the least, being confined exactly to quantity. We will not stop, therefore, to predicate any hypothesis of disease, but simply claim for its use the preservation from decay in the teeth, from the frequent removal of the secretions, thus preventing their lodgment and consequent alteration or decomposition. Not only as to the fluids themselves, but particles of food which become loosened are ejected from the mouth which otherwise would remain and decompose. In chewing, a double purpose is fulfilled by adding to the foregoing the mechanical friction of the tobacco itself, which induces cleanliness as well as health to the gums, by hardening their surfaces and giving as it were a kind of exercise or action promotive of health.

In the elements of tobacco, there is nothing which can possibly attack the substance of the teeth, the organic acids of the plant are too mild and must be inoperative, the organic bases as lime, potassa, ammonia, &c., can only act as antagonistic to destructive acids, whilst the nicotin is protective of all animal tissues from decomposition, so that here is positive good resulting.

That it can have a reflective bad effect upon the teeth, is impossible to suppose, from the entire absence of any proof of its being the cause of any grave disease or organic lesion which alone induces a secondary action. Observation will more clearly establish this. The best natural dentures coming under the writer's notice has been in the mouths of tobacco chewers of middle aged men, whilst women have proverbially much less perfect teeth than man, and we may fairly claim that part of this greater perfection may be derived from the habits of using tobacco, and we therefore claim that it has rather a kindly and preservative influence upon the teeth. B.

## ARTICLE II.

### *Treatment of Sensitive Dentine.*

We can treat this subject no longer as one, the course of which is doubtful, as it has become universally recognized by practitioners who have any just claim to science, that arsenic in some available or modified manner, is the one best suited by its qualities as a chemical agent acting upon the vitality of any part, as well as by its suitability in form or substance. The common method adopted in its application has been generally in the form of arsenious acid mixed with acet. of morphia equal parts. In this way it acts as a rapid and destructive agent, too much so to admit of it in the mere reduction of the sensibility of inflamed or sensitive dentine. The entire destruction of the vitality of dentine is not required in order to prepare cavities for filling, but a reduction of sensibility sufficiently so to admit of the required manipulative force, so that when a filling is accomplished, the superficial injury may be renewed by the recuperative efforts of the tooth. Of this power there can be but little doubt entertained, evidenced in examples of greater destruction being remedied by it, as in secondary dentine, and in the fact of the frequent subsidence of pain from carious disease.

That arsenious acid can be applied in all cases successfully for sensitive dentine, is the object of this article, the only question remaining is how and in what manner, for in the majority of cases, the requirements vary, perhaps according to constitutional proclivities, to certain forms of inflammation, or to natural repulsion of this metal oxyd, as is found in its medical administration. Again it will vary as to amount of the ingredient, as also to the duration of time it is used, these latter points qualifying one another, throwing results almost entirely upon the experience, judgment and acumen of the practitioner, but of its availability in all cases of any ordinary form of cavity, we assert, the question to be settled is simply how must it be used? Cobalt is not crude arsenic, as is so commonly thought, but a metal oxyd always containing large proportions of arsenic in its native condition, and has been used for the above purpose from the effect produced.

Arseniate of potash is perhaps the most powerful form of any application for this purpose, and must be used very guardedly and very much diluted or modified. Arsenious acid and morphia almost as much so, but either can accomplish the reduction of extreme sensibility in dentine safely, by working them up in warm wax and applying in this form to the cavity for a series of days according to the effect produced and desired. Where extreme sensitiveness is found, it is best to use one-fourth part of the crystals powdered in bulk, to four of white wax, and to carefully examine the cavity day by day, preparing it more or less at each examination, and when sufficiently so if creasote is allowed to remain in one day, the next filling can be safely resorted to without pain.

Crude cobalt is perhaps the best to use in this way. The little portions of stony matter must be removed from the cobalt and reduced to a powder, then softened wax is made to involve as much of this powder as it will hold in a plastic condition, and applied in this form to the tooth, the cavity previously dried, when it will be found to adhere forcibly, and if not too strong, without pain, which will generally follow a too powerful application, creasote being required to subdue the too rapid irritation produced; the object being to induce, as it were, an insensible action upon the parts subduing the pain arising from foreign contact, but not to destroy its vitality, and if this application is made skillfully it will accomplish it perfectly, often proved by the return of the former sensibility when the application has been withdrawn for a few days, and the tooth neglected.

It must be pursued with a systematic regularity, or else trouble may ensue from mismanagement, and not from the objectionable nature of the material; for instance, if the mixture has been allowed to remain too long and a filling inserted immediately upon its removal, the tooth will become discolored from its bad treatment. A pain of a violent character may ensue from a too strong application. The vitality of the tooth itself may be destroyed. These are consequences of unskillful use of the material, as a patient in pneumonia may be most effectually relieved of all suffering, or he may be destroyed by injudicious or excessive depletion. Thus the true use of arsenious acid is in all cases safely applicable, if its use is carefully and skillfully managed.

No doubt difficulties may arise to those unaccustomed to its management, but for years it has proved to be an universally available agent in avoiding excessive pain, successful operations coming daily under notice, experience fully warranting its advocacy.

The want of time is the only necessity for pain in filling teeth. Patients often require much accomplished in a given time, which necessitates immediate operation, therefore unavoidable pain, but with the privilege of time, there can be no justification of this. Cheap operators, itinerants, money jobbers, and speech makers, may object to this position, but facts and experience establish it beyond controversy. Let every skillful manipulator try it carefully and he will find results establish the truth, that all supersensitive dentine can be safely and surely reduced by this modified use of arsenious acid.

## ARTICLE III.

### *Vulcanite Base.*

FOR months past I have been using vulcanite base for mounting artificial teeth, and in every case where I have applied it, it has given satisfaction.

In making my first pieces I placed atmospheric pressure cavities similar in depth and width to those in swaged plates, and found that the suction was so great in several of them as to give pain.

Since then I have been very careful, where I use cavities, to make them very shallow. I think, however, that from a good impression the fit of the plate will be so perfect that atmospheric pressure cavities may be dispensed with altogether.

When I commenced using this work I found it difficult to keep the rubber from pressing into the joints of the teeth, and leaving a dark line upon the outside of the gums, although careful to make close-fitting joints. I now remedy this by using "Roberts' Os-artificial," or "Pierson's Osteoplastic," which, after the piece is in the flask ready for packing, I introduce into the joints from the inside and allow it time to harden.

Although no advocate for either the "Osteoplastic," or "Os-artificial," for filling teeth, yet for use in the manner above described, I think them valuable.

In the August number of the "Vulcanite Journal," dry plaster coated with a solution of glass is recommended for overcoming the same difficulty. But, after due trial, I think the preparations I have mentioned above, not only answer a better purpose, but are more easily introduced.

Another, and a more serious difficulty that I had to contend with in partial sets, where I wished to set the teeth directly against the gum, was, to prevent the rubber, when screwing the flask together, from pressing over the alveolar ridge between the teeth and gum, thereby lengthening the teeth to such a degree, by adding to the thickness of the plate, that it was necessary to grind them off, and also causing them to stand from the gum. This difficulty I remedy in the following manner.

Placing my plaster model taken from the impression of the mouth into the lower part of the iron flask, and having the teeth arranged upon a wax plate, the fac-simile of the rubber set I wish to make, and all being ready to fill the upper part of the flask with plaster, I cut away that part of the plaster model against which the gums of the teeth press, allowing them to hang free over the alveolar ridge, so that when I pour the upper part of the flask, the plaster will run under the gums of the teeth, filling up the part cut away. Separating the parts of the flask, the gums of the teeth from which you wish to keep the rubber, will be found covered, and consequently protected by plaster from any excess, which would otherwise press over them. I cut around the circumference of the piece a deep vent, and a number of small ones leading into it from the edge of the plates, as no harm results from too many vents, which would, were there not enough.

I vulcanize in one hour with the steam at 330°, by means of gas, preferring it to alcohol, the flame of which is more difficult to regulate.

I have made quite a number of pieces of this work, and so far have heard no complaint from the patients who wear them, with the exception of one who thought the plate at times produced an unpleasant taste, but upon examining his mouth I discovered a molar tooth affected with abscess and discharging pus. I extracted the tooth and have not seen the patient since.

## ARTICLE IV.

### *The Movement Cure.*

Human ingenuity exhausts itself to supply man's real wants less effectually than it does the supposititious demands of his infirmities and his imaginary evils.

In the time of Galen and Hippocrates the resort to the actually known remedies was less than to the fabulous and the unknown. Some wondrous insect was swallowed or decocted to cure a broken leg or diseased liver. Herbs were invested with magical power and sought after by emperors and kings to regenerate the morals of their subjects. Even in Elizabeth's time grave physicians lectured upon the heaven gifted influence of combinations as absurd as repulsive, finding the lord and the boor out of number, who had been blessed by their healing influences.

Mazzini and his loved and loving queen trusted and feared their absolute quack whilst they abused and suspected their truly honest and learned doctor. Homeopathy found crowds of silly idolators, who obeyed and trusted, swallowed and prayed, cured by nothing, in worshipping the little pellicle and the vulgar nonsense of Hahnemann. Later, steady England gave birth to the *brandy* and *salt* cure, built a fine establishment to remedy evils by rubbing in, what had been produced by pouring in, with all other evils poor flesh inherits. Hydropathy drew thousands to have their wits renewed by constant washings. Sleeping in water, walking in water, living with vapors and water perpetually, was believed capable of anything however absurd and ridiculous the fact. A dry cough—wet sheet, a broken limb—wet sheet, chronic pneumonia—wet sheet, gout—wet sheet, a broken conscience—a wet sheet, a broken heart—a wet sheet. The babe in its cradle with its mother's tears, the feeble old man, dropping kindly into the grave, were all subjects for the wet sheet—yes, and was believed it would cure your uncle dead an hundred years, or subjects quite as reasonable. Rochester wizzards', Clairvoyants' and Spiritualists' power have all been addressed and performed their wonders, had their infancy of promise, youth of growth and indulgence—old age of puling decay and death, their victims buried by the graves of their fathers, and their memories, like their ghosts, invisible and unfelt.

Human nature and human ingenuity, true to their instincts, on the one hand, call for something new, and on the other hand, most lugubriously supply the call, by sending the *Movement Cure*, from Switzerland or Germany, the birth-place of many monsters, perhaps the last, the least, for it simply advocates the sac-cloth and ash cure, of pounding the diseased part until it whips it into subjection.

Dear reader, you may have the indigestion, as I take you for a dentist, well you are now to be cured by taking a *padded paddle*, on one side soft, the other hard, and you are to belabor your stomach until its sore complaints are silenced, and to aid it in this worthy purpose you are to beat the rest of your body until induration relieves you of all trouble, in your becoming like a rhinoceros or alligator to all applied forces. There is something extremely pleasant about this coming nonsense. *This new god of the hypochondriacs*, is *destined to become*, as by comparison, *very popular*, for it gives one a hope that justice may be done occasionally, blindly though it be, by having your enemies soundly beaten at times, for all our enemies are fools and will require the *movement cure* to aid them. One thing is to be feared, that all may wish to become doctors of it, our brotherhood consequently deriving considerable relief, from which we gain some hope and consolation.

We said extremely pleasant this movement cure, fancy a patient with the rheumatism or gout going through a dose of *movement*. He is belabored and boxed after a perfect system of hardest blows to sorest parts, no matter how they wince or groan, blow follows blow until they actually yell with pain and exhaustion. Seriously, we think it an admirable remedy for the ills of the country of its birth, life's lassitudes are so easily borne by the German, and his languid dullness makes him a constitutional dreamer, this *movement cure* would kindly awaken him from his metaphysics, dispel the vapor which surrounds his mental vision, and justly punish him for introducing the silly, wondrous pellicle.

Something sagaciously practical in beating our poor bodies for their physical misdemeanors, but we can hardly overlook the man who is always saying *yaw*, for introducing corporeal punishment for the inherited evils of our forefathers, for thus the just perhaps may receive punishment for the unjust. The consumptive subject instead of passing from time to eternity in peaceful quiet, must thus pound his poor breast to atone for the errors of his progenitors.

Is it possible that the history of this year is to be burdened by the silly tradition of this irresistibly comic proposition? We look around in hopes of some means to pass opinion from, in the negative, but alas when we see mankind in herds, like cattle, grazing down the opposition to their monstrosities in one section, still growing, emigrating to another; societies, springing up confessedly in opposition to the purest conservatism of domestic and political life; vagaries assuming systematic existence, we are compelled to admit, that human nature in its abstract points, is the same now as hundreds of years ago, when a cock chaffer was thought to possess the power of reinvigorating the germ of life, so now thumping the body will doubtless have many attachés, who will believe it to be the last scientific discovery.

## ARTICLE V.

### *The Practical Utility of Dentistry.*

By A. J. Brown, D. D. S.

It is sometimes said that we are living under a curse, that the judicial sentence of the Creator which has consigned the teeming millions of Adam's race to a condition of toil imposing upon them the necessity of earning their daily bread in the sweat of their face, is felt to be burdensome, if not oppressive. But this sentiment is generally found only with the unreflecting, for what would be the spectacle presented if the various trades, callings and professions which now give employment and the means of subsistence to civilized men, were to be abolished, and means of supporting life without involving the necessity of labor, should be put within the reach of every man? Who does not see that it would be followed immediately by a rapid degeneration of the human race? Anarchy would reign in the place of law and order. Government, in all its departments,—in the state, the church and the family, would give place to the dominion of mere brute force; purity and refinement would flee before the unrestrained power of sensuality, and so rapid would be the retrogression of education, science and the arts, that only a very brief period would be required to reduce the most enlightened nation on earth to a condition worse than any barbarism known in the annals of the world. What, but the *necessity of labor* prevents us from calamities so great?—That necessity, then, while it results from a judicial sentence of the Creator, is among the most merciful provisions for the well being of man.

Among the various callings and professions which have originated in the necessities of the human race, there is to be seen a great diversity, both as regards the degree of perfection to which they have attained, and the purposes of utility which they are intended to serve. I propose, in this paper, to call attention to the ample sphere of usefulness which is afforded by our profession, with a view to setting forth the benefits we dispense, and of showing upon what insufficient grounds the opinion rests that ours is an unimportant calling—an opinion more than expressed when it is said of any one of our brethren, "*O! he is only a dentist!*"

There are to be found in every profession and calling, men who are actuated only by selfish motives. To supply their own necessities and provide for their own enjoyment in life, are the only objects which stimulate them to study or labor. It follows, therefore, that so far from proving a source of daily pleasure to them, their employment must be found irksome and burdensome, and the time devoted to them a period of unhappy slavery. But when from the outset the aim of the practitioner embraces the good of others, and experience has taught him to appreciate the luxury of doing good, he finds his duties and employments a *pleasure* which not only reconciles him to whatever burdens they may impose, but incites him to enthusiasm and inclines to patient study and toil, with a view of advancing to perfection in the art he loves. Looking beyond the limits of self-interest and the sphere of self-enjoyment, to the purer and nobler field where philanthropy dispenses its blessings and man lights up the sorrowful eye of his fellow man, relieves him of his burdens, mitigates his afflictions, and pours the oil and wine of comfort and peace into his stricken bosom, the dentist as well as the physician beholds his unselfish mission, and devotes himself to the amelioration of the condition of his fellow beings. In an object so noble, he will find enough to stimulate him to industry and application, in the developing and perfecting of all the resources of our art. He will study to acquaint himself with all those principles of philosophy, surgery, and laws of chemistry which the science of dentistry involves, and a knowledge of which is indispensable to its pursuit and its advancement to that perfection to which it is ultimately destined to attain.

But while in his office or laboratory, the practitioner of dentistry applies himself with patience and industry, to the duties of his profession, his labors will be attended with only limited results, unless the benefits they are intended to confer are known and appreciated in the world. Hence the aid of the press, must, in this, as well as in all other subjects of importance to the well being of the public, be invoked. Through that powerful agency, our profession must seek to inform the public mind of its humane objects, and of the constantly increasing means it possesses for their accomplishment.

It is perhaps true to a degree but little suspected, that there is a lamentable ignorance prevailing on this subject —that comparatively a few, only, are aware of the importance of a healthy, well managed denture, or of the various causes which produce, and are constantly producing effects not only upon the teeth, but the general health, which are extremely deleterious.

Does any one ask for a proof? He has it abundantly supplied in the common practice so very prevalent among the young and the less informed, of using their teeth as *nut crackers*, or crushing other hard substances, obviously contrary to the intentions of nature. He has it in the less apparently, but equally pernicious, habit of partaking of ices at one moment, and at the next of drinks on the other extreme of temperature, whereby are incurred the evils which result so disastrously from the subjection of the teeth to a sudden transition from cold to heat.

Perhaps it would not be very far from the truth to affirm that a majority of persons who give any attention to their teeth, are influenced by a consideration of beauty, rather than of utility; or at least they do not go beyond the object of securing a corrective for the otherwise unpleasant odor of their breath; and while we would by no means undervalue the importance of these objects, knowing the additional charm that beauty borrows from a regular, unbroken, spotless set of teeth, and the fact that applications for divorce have been based on the fetid breath of a conjugal companion, we would yet maintain that it is the province of the skillful dentist not only to supply the one, and correct the other, but to confer more valuable benefits, or, if you please, avert greater misfortunes. Need we adduce facts to fortify this assertion? The whole train of evils, beginning with calculous accumulations, sponginess of the gums, caries, abscesses, pain, nay excruciating, agonizing torture, convulsions, nervous excitement, delirium, compulsory fasting, exhaustion and prostration—and ending in the gradual but effectual destruction of the general health, or irremediably diseased condition of some of the vital organs, the stomach or the lungs, but all of which might be prevented by timely and judicious dental supervision, and operation—abundantly attest that amplitude of the field of usefulness which is open to the diligent and skillful dentist. But to all this might be added, the mental suffering, the irritation of temper, the loss of patience, which not only renders the patient miserable himself, but involves all others in unhappiness and disquietude, who come within the sphere of his presence. We feel perfectly safe, then, in saying that the degree of the influence of diseased teeth upon the health of the body, is neither known nor considered by the mass of our fellow creatures. It is a serious evil that information on this point is so limited, for this is not one of those cases in which the maxim —"where ignorance is bliss 'tis folly to be wise," is admissible. It would be as wise to neglect a gimlet hole in the bottom of a ship as to disregard the slightest indication of decay in a single tooth. Many of the diseases of the throat, so prevalent and so troublesome, are doubtless the result of decayed teeth, imparting disease to the mucous surfaces, which continues to defy all remedial agents, as long as the cause in the neglected teeth remains.

The necessity of proper ventilation to health, is now frequently made a theme for the scientific lecture, and the increased attention to this subject has verified the adage, "necessity is the mother of inventions." Many a piece of ingeniously constructed apparatus, and especially the ventilator but recently invented and patented by Mr. Colhoun of Philadelphia, attests the importance attached by scientific men, to purity of atmosphere. But why seek to ventilate your sleeping apartments, or leave the city, in sultry months, for the pure air of the country, while a cause is permitted to exist, which, at every respiration, conveys to the stomach and lungs, and from those organs to every part of the human body, a vitiated, infectious effluvia; which is as certain to interfere with the laws of health as the foul air confined in a ship or dwelling house, or the poisonous miasma which produces the congested and yellow fever of the South, by which thousands perish annually. It is a difficult task to produce a proper sense of the value of a sound and healthy mouth, in the mind of one who has never suffered the ills to which we have already referred. Only those whose lot it is to be afflicted or suffer from some obdurate or chronic disease, can appreciate the blessing of health. So those who are favored by nature, or have secured to them by the care and supervision of parents, a good set of teeth, can but imperfectly appreciate that benefit, or conceive of the life-long misery and discomfort which burdens the existence of those who through neglect or accident have lost their teeth, or have suffered them to fall into a diseased condition. How few, when pitying their friends suffering from the horrors of nervous excitability, neuralgia of the head and face, dyspepsia with all its train of mental and physical woes—conjecture the real cause, which, in innumerable cases, produces these painful and distressing symptoms! Bad teeth, retaining particles of food which decompose; imperfect mastication, rendering the process of digestion and assimilation uncertain and often impossible, though but little suspected, are frequently the productive cause of disease, which, accumulating in power, eventually consigns its victim to the grave—or what is worse, to the cell of the maniac.

Now, if to prevent such evils, and in a great measure remove them, by removing the cause by which they are produced, be the office of the skillful dentist, who can speak in terms of disparagement of his profession or his work? Nay, is he not, when combining the spirit of philanthropy and benevolence with the energy with which he prosecutes his business, justly entitled to be ranked among the benefactors of mankind? It has been said of one whose threescore and ten years have expired, that he has been heard to say, that, although in the course of his chequered life he had experienced a taste of nearly all the miseries usually incident to the present state of being—fortune and misfortune—wealth and poverty—yet he had suffered more real misery from the effects of bad teeth than from all other causes combined. Nor is this all.—This aged sufferer affirmed that had he been aware of the existence of the remedy at the proper time, and especially of the existence of the necessity of its application, he could have smiled upon all other evils with complacency. How would such a one, could he have the privilege of living his life over, with the benefit of his former experience, and his mind illuminated by the light of science, regard the dental art, and those of his fellow men who have devoted their lives to its advancement, and to the dispensation of the benefits which it proposes to confer on the race of man.

## ARTICLE VI.

### *Creasote.*

This is the most valuable remedy of the whole materia medica to the dentist, filling a want not to be so well supplied by any other agent. We therefore accept of it as a subject of the present paper, and may be excused for entering into some of the minor details of its history, characteristics and uses. Since its discovery by Reichenbach, it has had but few additional facts added to the good uses established for it by him, principally owing no doubt to the offensive and extremely persistent odor attendant upon its presence. It is obtained from almost all organic substances by destructive distillation, principally however from common tar, pyroligenous acid, wood smoke and some oils, being a laborious process, besides excessively disagreeable. The agents used, according to Turner, are potash, phosphoric and sulphuric acids, with ammonia.

Thus by frequent distillations creasote is eventually freed from its oily affinities, presenting a colorless and transparent fluid, much heavier than water, and boiling at 397°F., preserving its fluidity at 16.6°F. It absorbs chlorine by becoming resinified, a fact useful to know in the process of bleaching discolored dentine, which we think should be treated by this agent after the various chlorides have been used, so that any altered tissues may receive a preservative consistence.

Creasote decomposes nitric acid and is itself decomposed by potassium. It is soluble in alcohol, ether, sulphuret of carbon, euphion, naptha, acetic acid, (which makes a powerful caustic,) and acetic ether. One of its very valuable qualities to the dentist, is its capacity to hold resins in solution, which forms one of the best applications to exposed and inflamed nerves, suspending pain and at the same time affording a temporary shield against foreign matters.

A singular fact exists in its purely medicinal use, which renders it a difficult drug to administer, it forms but two combinations with water, 1.25 parts of creasote to 100 of water, the other, 10 parts of water in 100 of creasote.

One of the most powerful antiseptics with all animal tissues, it is again most efficient to the dentist in its application to carious teeth, whose offensive decomposition is more than corrected by it, for the power it has of coagulating all albuminous solutions, and also of changing the action of decomposition into more or less of an unchanging one, is especially useful, at the same time it is harmless upon the fibrous and earthy tissues. It is seldom to be had pure, as many substances are mixed with it, the only simple practical test however is its colorless quality, and even this is no safeguard against its adulterations with some oils, &c. Ettling gives the following analysis of creasote, which has been generally regarded as correct:

| | | | |
|---|---|---|---|
| Carbon, | 14 | Eq. wt. 84 | per ct. 77.42 |
| Hydrogen, | 9 | " " 9 | " " 8.12 |
| Oxygen, | 2 | " " 16 | " " 14.46 |
| Creasote, | 1 | 100 | 100.00 |

Pereira says, however, the equivalent of creasote must be considered as uncertain.

Its effect upon vegetable life is a uniform slow death, no doubt by attacking the organic oils and resinous constituents, from its strong affinity thereto. Upon animals, it has a no less startling result than hydrocyanic acid, destroying insects, as spiders, flies, small fishes, in a few moments, by subjecting them to water containing but a few drops. Injected into the veins of larger animals, it suspends the action of the heart, hurries respiration, and followed by convulsions and death. When injected into the stomach it is attended by disturbed vision, as dimness or fixedness of sight, vertigo and coma.

Upon man, the last author quoted says, creasote operates locally as an irritant and caustic; applied to the skin it causes heat, redness, and destruction of the cuticle.

On the tongue it produces a painful sensation. In contact with a suppurating surface it acts similarly to lunar caustic.

When taken in large doses it excites vomiting and purging, attended by a sense of burning and rapid alternations of great heat, especially in the pharynx, œsophagus, stomach and head, with vertigo and head-ache.

A singular feature of its exhibition is noticed by Dr. Elliottson, who knew a lady who increased the dose of creasote to forty drops before it disagreed; the addition of a single drop beyond this produced its usual symptoms of excess.

Its principal use in medical practice is to suppress vomiting, and has been found most effectual in cases of excessive nausea from pregnancy.

Perhaps its very best use is for dental purposes, as for instance in the inflammation of the periosteum of a tooth, it seems to be the only remedy at all efficacious. It is applied by saturating a soft cotton string and tying it around the tooth in contact with the gum; when this can be done it will generally be found to give relief, and if properly pursued by frequent and careful applications, will eventually subdue most cases of periostitis.

In the destruction of a nerve of a tooth it should always constitute a part of the application, to subdue the pain and irritation that arsenic will give rise to. A paste is commonly made of equal parts of morphia and arsenic with creasote, and thus brought in contact with the pulp it will most frequently produce the death of this part with but little if any pain. After the pulp has been removed, the tooth should be treated with this agent for some days, to purify the parts and induce a healthy cicatrization of the severed ends of the nerve and blood vessels. In teeth that have died from whatever cause, they should before filling, be subjected to a free use of creasote, for experience proves that this agent has a preservative power in this operation, which however difficult to explain, must be received as a fact, as well as a power to prevent subsequent inflammation, which to the dentist is an indispensable and invaluable quality.

We have not found it serviceable in obviating that extreme sensibility dentine so often assumes, and which is perhaps the most formidable difficulty of practice, not even in any degree, and the impossibility of making it continuously applicable in such cases, prevents the experiment being continued for a length of time except in some few cases of large cavities; even in these cases when an opportunity from the shape of the cavity has offered, other circumstances have prevented the test, so that we have not been induced to enumerate it as among the remedies for the reduction of the sensibility of dentine.

For tooth-ache, it certainly acts as a specific, when skillfully applied, for much depends upon the manner any application is made to an aching tooth. The difficulties are generally found in the neglect of two important cares, first, the absolute removal of all loose or foreign matters, or entire cleanliness, and the compression of air upon the nerve by covering the surface of the cavity with the wax before pressing it firmly, in order that it will be effectually retained. When a cavity is properly prepared in an aching tooth, and the saturated lint partially filling the cavity applied, the wax covering should be perforated with a hole so as to allow the free egress of air, otherwise the condensation of the air upon the inflamed pulp will be a sufficient cause for the continuance of the pain, but when properly done it will invariably mitigate the pain, if not entirely subdue it.

We mentioned the value of a solution of resin in creasote for this purpose, greatly aiding the exclusion of foreign matters, by forming a perceptible coat to the tender part, which fills the office of camphor effectually, as proposed by our books, in connection with this agent.

The successful treatment of abscess of the gums also imperatively demands creasote, injected into them if possible, if not, its application within their orifices as far as possible. Dr. Ballard, of New York, proposed inserting delicate pieces of lint saturated with it, renewing the same until healthy granulation appeared or cicatrization followed. This is the only treatment for dental abscess that can be termed at all successful.

We have used it most satisfactorily in disease of the antrum, where we found injections of diluted nitrate of silver, 4 grains to the oz., iodide of iron, &c., produce but little good effect, when creasote used 4 to 10 drops to the oz., acted with great success in relieving the pain and checking the discharge. One case of eight years standing, proved an entire cure under its use, inside of three weeks treatment.

In epulis we have used it in connection with lunar caustic with great satisfaction. Although it is by no means an active cautery, yet it acts by slow measure to the destruction of a part by a painless process which places it ofttimes as superior to more potential agents. One case in particular of this disease, we treated with the most immediate and happy result. It had been forming for about eighteen months, until it had reached the size of a large pea. I applied potassa opt. by placing a piece upon the tumor, and confined it there by wax formed around it and the neighboring teeth, occasionally using a little creasote to relieve the pain arising from the rapid decomposition of the tumor; in the course of four hours it was entirely removed, and the part freely treated with creasote, when in a few days a healthy cicatrice formed, proving entirely successful, without the common resort to the knife.

Indeed as a cautery, few substances will equal this preparation of potassa, and for this purpose, we deem it most valuable, because its action is much less injurious to natural teeth, especially when many have been filled, when nitrate of silver, or preparations of iron would induce bad consequences.

The writer's experience with it has been limited, but so far results have justified the highest estimation of it as a potent cautery. The experiments now being tried, as an application to destroy the nerve of a tooth, are not quite so satisfactory as could be desired, but this may be in a great measure attributable to the imperfect knowledge of its use, but a more extended experience is demanded to establish its efficacy in this particular.

Returning from this digression, we lastly come to notice creasote as a remedy for excessive ptyalism.

Burnt alum, various preparations of soda, vegetable astringents, and many washes, have all proved abortive in correcting that peculiar condition of the mouth resulting from mercurialization. But a wash of creasote, diluted at first to a great degree, and increased gradually up to twenty drops to the ounce, will be found to correct this unfortunate state more speedily and effectually than any other known remedy.

We translate from a French journal a few brief statements in connection with its general use. A Dr. Hasbach states that he has cured cases of cancrum oris with creasote, the disease being developed in children living in low, damp, and otherwise unhealthy places. It is spread upon the diseased parts with a hair pencil, the gangrenous parts readily separating. M. Arendt employs it for uterine hemorrhages, by injecting a solution in proportion two drops of creasote to five ounces of water. Also in bleeding from the nose. For external applications its strength should be increased from ten to twenty drops to the ounce, and applied by saturating bandages.

For burns it is said to relieve the pain, but not thought generally applicable. Dr. Forsten advises it in all erectile tumors, also in erysipelas. For diseases of the skin it is widely known as a sovereign remedy, and constitutes a chief feature in all palliative remedies for ulcers and cancerous tumors.

# ARTICLE VII.

## Physical Education.

It is worthy of notice that in the period when history must record the mania for all new doctrines and isms, we have had one of the most practically valuable novelties for the restoration to health ever introduced—Dr. Winship's system of Gymnastics. We call it novelty, not in the sense of being new, but as coincident with new humbugs of every kind, aiming to get a place in the rages of the day. It is particularly noticeable for its freedom from mystical pretensions, or from the wonderful; it is preeminently practicable and available to all. The masses of the people so long accustomed to receive blindly the arbitrary claims of the charlatan, that they hesitate to believe, indeed almost reject a matter which, with so little unintelligibility, promises to do what common understanding, when exercised, recognizes at once that it can do, that is, modify if not remedy the disease of the body—not by faith nor homeopathy; not by mystical washings, nor by hydropathy; not by the vegetarian temperance, but by such means as one can see are practicable, feel are useful and know to be solidly good, by at once enjoying their effects. He recognizes that hunger should be satisfied, temperance necessary, a wise indulgence in the good things of this life, a wholesome compliance to natural instincts. Drugs, manias and doctors are set down among the desperate resorts, and to replace these he supplies merely forty minutes' exercise every two days. We are not willing to go so far as the useful Doctor W. no doubt believes fully justifiable, but we feel assured that in the great majority of incipient diseases, his course will be found a practical panacea, with a better prevention of all future diseases than was ever received by a patient rising from a sickness supposed to have been cured by drugs. The practice of medicine is based upon hypotheses that our judgments are never forced to receive by practical, positive demonstration, but are simply cajoled into receiving the apparent evidence of that which must ever beg its conclusions.

The same reasoning being had would quite as conclusively prove many other inscrutable appearances as being derived from widely differing causes. Indeed, much contradictory evidence is found in the history of medicine. All who are read in medical literature will readily remember the contradictory evidence of our great leaders upon the effects and evidences of the use of strychnine. Dr. Taylor of Guy's Hospital, Mr. Letheby, and Mr. Heradeth, Prof. of Chem., affirmed that indubitable signs of the presence of strychnine were always found in the body. Dr. Christison, Mr. Nunnely and Sir Benj. Brodie could never discover any traces of it in the body. This diversity of opinion is frequent and naturally leads us to doubt the efficacy of remedies about which doctors do agree. It at least justifies a strong reliance upon remedies about which all can judge, and in the experiments of which no harm can possibly be produced. In the cause of medicine, we obviously suffer, not from our knowledge, but from our ignorance. True knowledge and science are as often misused and misapplied as they are made the instruments of vain-glory, self-love, self-praise or money-getting, tending to destroy confidence and the utility of science itself.

The system of Dr. Winship is essentially applicable to men in general, and would greatly benefit all who can be induced to adopt it, for human physiology demands a systematic exercise of the functions and powers of the body for the proper sustainment of health. Absolute inertia is nowhere found in nature. Animal life depends upon use and exercise—suspend them for any definite period and you produce disease accordingly. Every one is familiar with the results of well conducted training in all living nature, man being the particular evidence of this law dealing with higher organism. Among artizans may be found most marked proofs of this position in the higher development of the parts of the body used, when not overdone, as also of such as are not used falling to decay and waste.

We do not believe that hereditary proclivities can be entirely corrected, but that they may be kept in an inoperative state, by a judicious course of physical training, we have not a shade of doubt.

We simply protest against all generalities in medicine, knowing that each patient has differing conditions from all other patients in similar diseases. That which constitutes relief to one individual may not to another, and so we disagree with this idea that all disease, remotely or even approximately, is caused by an increased flow of blood to a part.

When such is the case, we cordially recognize the doctrine of Dr. Winship in distributing it equally all over the body, by suitable exercise, but in all atrophic diseases, tuberculosis, anemic conditions, these are not caused by a morbidly increased flow of blood to a part, but can be certainly benefited by causing an equal distribution of blood throughout the system.

Some other objectionable features may be found in this new system. All new introductions claim too much and do too little. This is not an exception. At the same time, this is better calculated to aid man in his struggle for life than any modern popular innovation.

## ARTICLE VIII.

### *Artificial Dentistry, Patents, &c.* By S. M. Shepherd, M. D., D. D. S.

It may be truly said, "The world is on the wing." In every department of science and art the watchword is "Advance!" Wonderful things are constantly being brought to light, and the word is heard on almost every passing breeze—"See, here is something new!" Conspicuous in the array of great achievements, is found the subject on which I now propose to write. There is no science connected with the interests of the human family that has made such rapid strides within the last fifty years as has that of Dentistry. It is astonishing to think how small a space it occupied in the world at so recent a date as a half century ago. Indeed, it can scarcely be said to have existed as a science at that day. True, there were a few men in the world who professed to be dentists, and performed operations on the teeth, but they had no laws by which to govern them in their operations, and if they conferred benefit it was the result of accident rather than skill. There was no literature—probably a dozen books or less would have comprised everything that had ever been written on the subject, and these contained the most absurd ideas imaginable, as has been proved by more recent developments. I say it is strange that a science which now occupies so large a space in the world, and one that is so important to the comfort of mankind, so extensively known, too, and appreciated, should have been so little known only fifty years ago.

There is now scarcely a town in all the civilized world, in which there is not one or more local dentists, possessed of all the modern improvements. Books by the hundred, have been written on the subject, and men capable of adorning any profession have entered the ranks; and colleges have been erected and filled with able professors, purely for the purpose of teaching this branch of the healing art.

But it is not my purpose to write a history of the science in any of its branches; nor will I undertake to describe the progress of that particular branch which heads my article, though it would be a pleasing task with the proper material at hand, to give an account of artificial dentistry, from the first crude operation down to the present mode as practiced all over the land. I only wish to speak of it as it is at the present day. If all the achievements which have been wrought out in this department of the science, were suddenly blotted out from the world, what a "shaking there would be among the dry bones." Countless thousands are enjoying untold benefits as the results of labor and skill in this branch, and still, *advance* is the word. While all the branches of dental science have rapidly progressed, the artificial branch has outstripped them all. By patient labor, both of mind and body, the most astonishing results have been reached. A whole denture is now so adapted to the mouth as to elude the closest observation as to there being anything artificial about it; and to the wearer they so fulfill the wants of nature in this regard, as to cause him to forget that he has ever been deprived of his natural organs. One might think that reasonable minds ought to be satisfied with such results, and be content to "hold fast that whereunto they have attained," and cease to labor for still higher attainments. But not so; the attainment of one benefit seems only to sharpen the appetite of the pursuer for other and larger benefits. What the end will be cannot be foreseen, but it is a subject of deep interest, both to the profession and to the public.

There has been an "irrepressible" tendency on the part of *inventors*, to cover their inventions with letters patent; and an equally strong opposition to such a course on the part of a large portion of the profession, who think that the dignity of the profession is lowered by it. This I have regarded as unfortunate—looking at it purely in the light of an advancing science. Those who make valuable discoveries, contend, with much plausibility, that they cannot afford to give to the profession the result of their investigations, which has cost them time, labor and money; and they only wish a reasonable compensation, while the opposing parties contend that the dental profession ought to be on a level with the medical, or that it is and ought to be considered a cöordinate branch of the medical profession, and there are no letters patent in the medical profession. Without attempting to decide the merits of the controversy, I may be allowed to express the opinion that it is unfortunate for both parties, as well as for the profession as a whole. So long as inventors claim remuneration for their improvements, the improvements must be confined to that class of operators who tolerate patents; and by consequence the tariff on patents must be proportionably high, and that of itself is a bar to many who have no objection to the patents, but are unable to pay the price. Those who are opposed to patents shut themselves off from improvements that are known and acknowledged to be such, and thus not only deprive themselves of the advantages which would result from their use, but they deprive their patrons of benefits enjoyed by the patrons of others who may be less skillful than themselves. As a general thing, those who oppose patents are high-toned gentlemen, well educated, and occupy high positions in the profession, and could, if they would, give credit to any real improvement that may at any time be made. But they scorn to give countenance to anything, good or bad, that comes to them under letters patent. Now, if we could compel our laborious inventors to *give* us the result of their labors free of cost, then no doubt all would be willing to examine and profit by all the real improvements that might be offered. But this we cannot do, and since we cannot profit by the labor of others without paying a small fee for it, the interest of the profession as well as that of the public seems to demand that we should tolerate patents—at least in the artificial department. If countenance could be given to the good, it would become better. Men of skill would be able to bring to perfection the crude idea that is sometimes offered as perfect, when in fact it is very far from it. Indeed the very best improvements we have, in all departments of science, require to be worked by men of practical skill in order to their perfection; and there is probably no species of contrivance known that profits more by skillful working than artificial dentistry.

The great ends to be sought in adapting artificial teeth, are, first, healthfulness of the mouth. To this end, no diseased teeth or roots should be left in its preparation for plates. And secondly, a comfortable fit of plates, of whatever kind, to the mouth. This, of course, embraces a conformity to nature as near as possible, both in feeling and appearance. And thirdly, durability; which includes purity and strength, with proper instructions to the wearer in regard to accidents from carelessness. In regard to the first, every dentist has his difficulties. Some people who *must have teeth*, will not submit to the right preparation of the mouth for them. This is always a trouble to the dentist who has a right appreciation of his calling, because his highest object is to make the mouth healthy; and he knows he is contributing to make it otherwise when he covers with plates, unsound and unhealthy roots. But he cannot help it and ought not to be blamed for the result. The second point named, viz. a comfortable fit, has been more difficult to attain than almost any one thing upon which so much time and labor has been spent. For many years, gold was the only material known as a base for artificial teeth; and the only mode of preparation was that of rolling it out into plates to be cut and fitted to models between dies made of the softer metal. A *perfect fit* never could be obtained by this process, for several reasons. In the first place, the shrinkage of the metals rendered it impossible to get a perfect die; and in the second place, the die being softer than the gold plate, when the gold plate came to be forced down upon the die to give it form, the small prominences on the die always yielded more or less, which, of course, prevented the plate from taking the true shape. Many expedients were resorted to for the purpose of overcoming these difficulties, but none succeeded fully. A studied combination of metals for dies, with a view to hardness, so as to maintain shape under the hammer, and at the same time to cool without shrinkage, resulted in some benefit, but fell short of the objects. I know that plates were so constructed as that an approximation toward a fit was obtained; but a *perfect fit never*. But the most annoying circumstance is the warpage of the plates, which always occurs to a greater or less extent in the process of soldering on the teeth. The fit of the plate is never, after soldering, what it was before. These, and various other difficulties met with in the working of gold plates, have led to the application of other substances to this purpose—of which Blandy's Alloy, by the cheoplastic process, and the Vulcanite, or hard rubber, are in the most extensive use. I have not sufficient acquaintance with the latter to speak of it definitely. It looks well, and seems to be capable of being perfectly fitted, and at the same time of filling all interstices, so as to render a piece cleanly. I have some doubt whether it will not become frail and disintegrate by use. This can only be determined by time.

With the *cheoplastic* process I am more familiar, I have used it in my practice now three years and a half, and can therefore give some points in its history as well as its present adaptation. I feared at first that the metal would corrode in the mouth, which if it did, of course would render it unfit for the purpose. But I had such assurances that it had not, so far, I was induced to try it. It possessed so many palpable advantages in other respects over any thing else I had seen, I was disposed to try it and take the risk. I soon found that I could not use the teeth prepared by the patentee for the process; and if I could not have obtained a different tooth I should have been forced to give it up in the very beginning. But I conceived that a tooth might be made that would be better adapted, or at least that I could use to my own satisfaction, I therefore got up a model and sent to Messrs. Jones, White & McCurdy, of Philadelphia, and they declined to make it, on the ground that it was very expensive, and being a new thing it was doubtful whether it would ever pay. I then sent to Messrs. Orum & Armstrong of the same city, who also declined at first, but on reflection they concluded to do it. The result was that I got a tooth exactly suited to the process, according to my judgment. I have used these teeth exclusively from that time to the present, and I find them easy of application in all practicable cases. They are also strong—never separating from the metal without first breaking. The shape of my tooth enables me to present a perfect crown above the metal—inside as well as out—and to finish the surfaces of metal around the necks of the teeth in accordance with the shape of the natural gums better than any other tooth I have seen. When I obtained this tooth I thought, if the metal was pure enough to be worn in the mouth, I could make of it all I wanted. To insure the purity of the metal, I adopted the plan of gilding, by the galvanic process—for which purpose I ordered a small battery, with which to do my own gilding. I used for the purpose *pure gold*, and gilded thoroughly. Gilding was not claimed by the patentee as at all necessary; but a piece looked better, and I fancied it was better; and now, after a trial of three years and a half I am satisfied that I was right in that conjecture. I have put in only one piece from the beginning until now, so far as I recollect, without gilding, and that was temporary. In casting the plate for that piece the metal did not flow freely, and a hole was left in the plate about the size of a gold dollar, which required to be filled up, and it was done with a solder that was prepared by the patentee for such purposes. The piece was worn six or eight months, and a new piece was constructed to take the place of the first, and to be permanent. On examination of the first piece I found that corrosion had taken place on the patch composed of solder, and it was nearly destroyed—corrosion having gone quite through it. I had very few defects of this sort after the first, requiring to be patched; but at the first they were common; I finally learned however, how to cast perfect plates. But many of my first pieces had patches of solder in them, and this is the only one I ever saw destroyed by corrosion. I naturally inferred that they were protected by gilding. I suppose if this one had been well gilded I should not have seen any corrosion upon it. I have in my possession a whole upper set which required to be renewed after it had been worn twelve months, and though it was *lightly* gilded it retained its purity perfectly, and the eye cannot detect the least corrosion upon it. There were many advantages claimed by the patentee for this style of work over all others, all of which I have found, so far to be just, and after a trial of three and a half years, I prefer it decidedly to any other. It requires nicety of workmanship, but when *done up right*, it does seem to answer all necessary ends better than any thing else I know of. To ensure a perfect fit, I have no doubt that impressions taken in plaster are far more accurate than those taken in wax—especially for whole sets. Plaster fully represents the soft as well as the hard parts of the mouth, and when a plate is cast on a model that was taken from a plaster impression, I find that it rests firmly on the palatine arch and does not require pressure to *carry it home*—so to speak. There is nothing that gives more satisfaction, both to the dentist and his patient than a perfect fit; and this he may have infallibly by *casting* his plate on models taken from plaster impressions. I speak of this as a mode of inserting artificial pieces, with which I am acquainted: there may be other modes equally good. Whatever mode gives *entire* satisfaction to the dentist and his patient is good, and the dentist will not give it up, if he is a sensible man, unless something better presents itself. I am frequently called on by men who offer me new modes of putting up teeth, and when I tell them that I use the cheoplastic mode and like it, they express astonishment, and often say, "you are the only man I have met with that uses it." I suppose their object is to invalidate every other style that they may make sale of their own. My motto is in these matters, "prove all things and hold fast that which is good." If I could have this style of work a *little lighter*, I think I would like it a little better. In whole upper sets it would be an advantage to have it a little lighter, in some cases. For lower sets, or partial sets, the weight never troubles me; and I do not think it would be a whit better if it could be made as light as a cork.

I would therefore suggest to members of the profession whether it would not be better to deal more leniently with patents, and let them have a fair chance, so that if they have any thing good in them it may be brought out. I was constitutionally opposed to patents, but I found that I could not get what I wanted without them, and though it went against the grain to patronize them, I was compelled to do it or be the sufferer myself. I do not regret it. I would not to-day, for half my artificial practice, relinquish my right to the use of the cheoplastic process, and still I wish all other modes prosperity; and if any other mode ever gets to be better than cheoplasty, I shall only have to be convinced of it to adopt it.

The artificial branch of our profession is, as I have shown, an important branch, and one that has undergone more decided improvements than any other, and as I have stated before, it is to the interest both of the profession and the public, that enterprise in this department should be fostered.

## ARTICLE IX.

## *Some Cases Illustrative of the Nature and Treatment of Pain about the Face—Facial Neuralgia.* By C. McElroy, M. D.

No attempt will be made in this paper to present an elaborate monograph on the subject of facial neuralgia, or pain about the face—but, some cases will be narrated of very opposite pathological character, and relieved by very different remedial measures.

The reader will understand, then, that what follows are the actual experiences of a country physician, with the realities narrated in a style of a professional conversation, seizing the distinguishing features, rather than the minutia of their progress, to recovery.

W. F., æt. between 25 and 30, is a laboring man, of ordinary good health, a teamster, and married. When exposed to the chilly wet weather of early autumn and spring, is frequently seized with face-ache, commonly confined to one side, with very tender teeth—many of them carious—but still only giving trouble on such occasions. This state of things yields very kindly to one or two decisive doses of morphine, followed, after the subsidence of the pain and tenderness, by a saline or oily purge. He seldom loses a day, if the decisive doses of morphine are taken at night.

A peculiarity of his case is, that no other form of opiate produces this result. This case is classified as one of facial neuralgia strictly.

Mrs. J. B. A., is a lady in the meridian of life, good general health, with the cares of a large family pressing on her; became troubled with a cough in the autumn of 1859—probably a sub-acute bronchitis—and possibly, somewhat asthmatic, which excited but little solicitude. Domestic, or homeopathic treatment only, was made use of, up to the early part of January, 1860, when opportunity offering, she made a trip of some hundreds of miles to join in some festivities in the family of a relative; her family thinking the trip would benefit her.

Contrary to their and her expectations, she became much worse during her outward bound trip, and arriving at her destination, her powers of endurance were sorely taxed to join in the festivities for which she had gone. She continued to grow worse until she arrived at home again, having been absent about a week. A homeopathic physician saw and prescribed for her during the next three days, but she continued steadily to grow worse. Saw this lady in the forenoon of Tuesday; found her with extremely anxious countenance, flushed face, rapid pulse; considerable cough; intense pain in her right eye and about the temple; great intolerance of light; tongue furred, appetite completely gone, and sense of extreme exhaustion. A sad picture indeed. Her only entreaty was relief from the agonizing pain about the eye and in the eye, or she would go blind.

With as little delay as the importance of the case would admit, an emetic was decided upon as the first step in the treatment. Ipecac. and capsicum. After emesis to take hyd: c. creta, Dover pow. and morphine; chloroform and heat to her eye and temple.

Wednesday.—Emetic had operated freely. Had taken powders as directed. Stomach had been more or less irritable all night, with occasional vomiting, and on the whole very little better. Pain intermits occasionally. Treatment to-day, brandy and morphine; mint water, with creta ppt., to settle stomach. Chloroform and aconite to temples, with heated flannels, or raw cotton to the eye and temple. To take some nourishment if possible.

Thursday.—Patient very little better. Pain very severe. Could not take brandy—thought it made her worse. Had a very bad night. Is suffering severely to-day. Applied magnets—electricity, with no relief. Mustard poultices to the stomach; hot foot baths; milk punch; morph. and hyd: c. creta, with a continuation of the hot applications to eye and temple.

Friday.—Patient no better—passed a bad night again. Pain about temple and eye still very intense. No motion of bowels. The existing state of things was very discouraging both to patient and physician, and her urgent cry was still for relief from the intense pain. Asked for ice, salt and thin cloth. Pounded the ice fine, and proceeded to make a freezing mixture to apply to the seat of the pain. Patient very much alarmed, as was her daughter; wanted the matter postponed; was certain it would make her worse. When all was ready, permission was obtained to try it. The pounded ice and salt, enveloped in a thin cloth, was applied and kept on, perhaps, half a minute; patient complaining of intense burning. A little rest and it was re-applied, and removed as often as she desired, during a quarter of an hour. When the application was over, all pain and soreness was completely gone, and patient was very much relieved, and expressed herself very grateful for it. Directed ice and salt again, if pain should return—to take a seidlitz powder, and eat something.

Did not expect to visit patient again without being sent for, and on Saturday morning had a message from the family to the effect that the medicine had moved her bowels so severely that she was in great danger from exhaustion. Hurried off to see her; (three miles.) Found her entirely relieved of all pain and soreness about eye, tongue cleaning, pulse good, but somewhat feeble, and every thing in the best possible way. Gave a little brandy and creta ppt., and requested its repetition in case her bowels continued to act, and to eat as much as she could.

The relief was perfect and complete. In less than a week she was quite well, and had regained nearly all her loss.

This was a very curious and interesting case to me. Its pathology is not very plain. The most probable hypothesis is, that the nerves or nerve coverings about the temple and eye, were in a state of inflammation or irritation. One thing is certain, that the narcotics externally and internally, did not benefit her much, if any. The freezing mixture was most likely the potential counter-irritant, combined with the mercurial alterative, that removed the difficulty. The physician was quite as much gratified as the patient at the somewhat unexpected, sudden, and perfect recovery of the patient, from so harrassing and distressing a difficulty.

A. L. W., æt. 35, an active though nervous gentleman, enjoying in the main good health, is at uncertain times seized with violent pains in the right eye, which soon becomes intolerant of light, and deeply infected with blood, accompanied by rapid pulse, flushed face, anxious countenance, &c. Is generally relieved by a decisive dose of morphine and calomel, and not by either separately, as found by frequent experiment. Upon one occasion, several years since, had to have a slightly carious tooth removed before recovering, after vainly striving with remedial agents two weeks. After the removal of the tooth, his recovery was rapid and complete.

Mrs. J. B., a lady eighty years of age, has been remarkably healthy during her long life, entered the summer of 1860 with crippled health, tongue furred, appetite bad, with great sense of exhaustion and weakness, but apparently no settled disease, unless a rheumatic condition of the lower extremities could be so called. The limbs were not in actual pain, but stiffened, and difficult to move. All this stiffness upon a sudden, took its leave, and in its place she had a violent ache in the head and face. Diagnosing this to be a metastasis of her rheumatism, every effort was made to repel it from the head, and invite it back again to her feet and limbs, chloroform, aconite, laudanum, camphor, ammonia, and the freezing mixture, were in turns applied to her head and face with but little relief; while stimulant foot baths, frictions and poultices, were applied to the extremities. She bore opium very badly, and its use was, consequently limited, but she had brandy and narcotics. Small doses of calomel with an occasional dose of Husband's magnesia, were the effective agents in her relief. She is now rapidly regaining health and strength.

Mrs. J. S. C., an exceedingly delicately organized lady, in the meridian of life, whose residence is in New York city, with, for the last four or five years, fair average health; was taken ill while on a visit to relatives in our city, during the last summer.

From her peculiar organization she had some idiosyncrasies in regard to standard remedies which forbid, as she had been told in New York, their use in her case. I found opium was out of the question, and she had a great terror of calomel and blue pill.

Respecting, as I did, her prejudices, they were not employed in the earlier part of the treatment of her sickness, though indicated at times very strongly. Her case was diagnosed as *hay asthma* or *autumnal catarrh*, characterised by severe cough, great sense of exhaustion, intensely reddened mucous membranes; and at a later stage, intense pain in the head. Finding it impossible to obtain relief from stimulants and external applications, recourse was had to an emetic, followed by blue pill and magnesia, with prompt and effectual relief, as she rapidly recuperated, recovered strength and appetite, and went home very much improved, with few, if any, traces of her tedious illness while absent.

J. T., æt. 25; cotton factor, of good general health; consulted me in the fall of 1859, for intermittent headache, for which quinine was prescribed, which, however failed to arrest it. The doses were repeated in much larger quantities until it was satisfactorily ascertained that they would not arrest it. Local applications of every conceivable sort, including electricity, also failed. Alteratives, with purging remedies, were also prescribed, with like results. The last prescription was carb. ferri. precip: which likewise failed, when he ceased to consult me, having made up his mind he could not get rid of it. Some time after, a tooth-ache sent him to a dentist, who extracted it, after which, for months, his headache never returned. It did however return, when a tooth was found tender and extracted, since which, up to this time, he has had no return of the pain in his head, and enjoys very good health.

No claim is made to any of the cases cited, as being, in themselves, very remarkable; on the contrary, they are common; but they fairly represent several aspects of facial neuralgia, and pain in the head. From them we may deduce as follows:

That the cause of pain in the face, or about the head, in the majority of cases, must be sought for elsewhere, than the seat of the pain.

That local applications, of themselves, do not possess much value as remedial agents. The apparent exception in the second case, must be received with some caution, as the constitutional treatment was in progress at the time of the application of the freezing mixture, and culminated in the critical discharges from the bowels the following afternoon and night; though due credit must be given for the prompt relief it gave at the time.

That the general principles applicable to the treatment of inflammation, irritation and congestion, are pretty certain to bring relief of a permanent character, as opposed to the plan of temporary relief from external applications, and stimulants internally.

That when the cause is located in a caries of the teeth, or periosteal inflammation, constitutional treatment, for the most part fails; the tooth or teeth must sooner or later be removed—of this character was the third and last case.

That where the irritation is in the nerve of the decayed tooth or teeth alone, decided doses of narcotic stimulants will, for the most part, be successful.

Lastly,—That while, as physicians, we must respect the prejudices and opinions of patients, we must not allow them to interfere too long with correct medical diagnosis and theapeutics, based upon well ascertained truths in the healing art; for, at a proper moment, the prejudices of all sufferers will give way to correct and rational treatment, founded in general principles, and with a well grounded hope of relief.

## ARTICLE X.

*Fractures of the Inferior Maxilla.* Description of the gutta percha apparatus, designed for treatment of fractures of the inferior maxilla—Case exemplifying its good effects. By Dr. Corne. Translated from the French by W. A. Harris, M. D., &c.

Obs. *Vertical fracture of the inferior maxilla—consecutive phlegmonous abscess—persistent displacement—employment of the gutta percha apparatus, on the thirteenth day—rapid cure.* Sauzet is a cuirassier in the 10th regiment, of a good constitution, born in the mountains of Drôme. On the thirtieth day of June he received a kick from a horse, in his back, which threw him forward; his head struck against the angle of a wall; for a few moments he was insensible. He was immediately carried to the hospital, where on the anterior part of the chest marks of contusion were discovered, but nothing in the dorsal region, which escaped the force of the hoof; pulse slow and depressed, sputa red and bloody, dullness of intellect, pain resulting from a violent contusion on the left angle of the maxilla, and under the mastoid process. There was no facial deformity, and auscultation of the chest revealed only a slight mucous râle.

The interior of the mouth was carefully examined, and I detected a little laceration of the gums, between the right canine and incisor teeth; and observed a fracture whose direction was upward, between the incisors and canine, and vertically downward; no contusion of the integument, no displacement; simple mobility with crepitation. The hemorrhage proceeded from the dental artery, but was not profuse.

I bound the neighboring teeth with a small waxed thread, and applied a bandage around the chin, directing continuous cold applications; in the evening there was headache, pulse accelerated, V. S. to about twelve ounces, cold applications. July 1st—dulness somewhat diminished, pulse good, no displacement, bloody sputa. Owing to the deficient intelligence and intractibility of the patient, this condition of things was of short duration, as he would not submit to the cold applications or bandage, and moreover was troubled with bronchial catarrh. He speaks, coughs, and spits without using any precautions.

2d. The linen thread was replaced by a metallic one, and the first chin bandage, by one padded and stiffened with gum. Diet, pectoral infusion, opiate potion.

3d. Last evening the patient had a chill; same swelling at the left angle of the jaw, with acute pains, bloody sputa, slight œdema of the face, and sub-maxillary engorgement. Milk, pectoral infusion and opiate potion.

4th. Vertical displacement, rupture of the metallic thread, febrile heat; mercurial frictions and emollient cataplasms under the maxilla.

5th. Sleeplessness, considerable vertical and antero-posterior displacement. The right fragment carried upwards and outwards by the action of the temporal, masseter and pterygoid muscles; the left, drawn downwards by the platysma, omo, and genio-hyoid. After their reduction, I applied successfully the following apparatus, and the fragments preserved admirably their proper relations.

It is composed: 1st, of a buccal metallic gutter, parabolic in form, which is applied to the teeth near the fracture; 2d, of a metallic plated chin piece, concave and parabolic; 3d, two iron or steel bands, soldered to the buccal gutter, arranged to support the lower lip, and then descending vertically to be received in two screw rings, which are connected with the inferior plate. Two screws adapted to these bands, below the screw rings, admit of the approximation or separation, at will, of the two plates, whose action is identical with that performed by the fingers of the operator, during the reduction.

6th. Sanious sputa, difficulty in speaking and drinking, submaxillary pain and tumefaction; the tumefaction and pain at the left angle of the maxilla have disappeared, œdema of the face continues. Milk, pectoral infusion, opiate lotion, laxative enema.

7th. During the night, in a violent paroxysm of coughing, the patient displaced the apparatus, and two of the incisors were luxated. Cephalalgia, sanious sputa, submaxillary tumefaction increased, with considerable displacement. Diet, pectoral infusion, cataplasms, mercurial inunctions, opiate potion.

8th. Punctures on a level with the submaxillary gland, escape of about an ounce and a quarter of laudable pus. Same dressing, omission of the apparatus.

9th. Fluctuation perceived between the hyoid bone and the chin, evacuation of about an ounce, by a second puncture. Sanious and purulent sputa, same displacement—simple dressing.

10th. Appearance good, facial œdema has disappeared, submaxillary phlegmon diminished, and furnishes but little pus; the patient nourished with milk, soup and panada.

11th. General condition satisfactory; suppuration checked, but same displacement remains; dressing simple, milk and panada, pectoral infusion, opiate potion.

12th. Sleep, pulse regular, and appetite.

In view of the inefficiency of the retentive apparatus employed, after the persistent luxation of the two teeth, and the want of solidity of the others, and of the complication of a large submaxillary abscess, I decided to await a more complete improvement, intending, on the occurrence of this event, to act promptly in adjusting the fragments.

13th. Meanwhile there was published in the report of a meeting of the Chirurgical Society, an analogous case of fracture of the inferior maxilla, which M. Morel Lavallié had reduced and cured, by the employment of the gutta-percha; I made trial of his apparatus, and succeeded fortunately beyond my expectations.

I will not resume the consideration of the displacement, which, in relation to its height, was vertical, and to its thickness, antero-posteriorly. The reduction was made, and very easily executed. The left fragment is rendered motionless by the interposition of a piece of cork between the large molars; on this side, a small stick, about an inch long, and one-tenth of an inch thick, is introduced by separating the right labial commissure between the large molars; with this lever, whose point d'appui is at the extremity which bears upon the superior molars, whilst the power is at the other end, in the hand of the operator, by a simple depressing and rotating inward of the hand, we obtain the approximation of the resisting point, namely, the right fragment, which is in advance of that of the left side.

An assistant repeats the movement, and is charged with the coaptation. I then apply upon the dental arch, at the seat of fracture, a small band of gutta percha, parabolic in form, five centimeters long, twelve millimeters thick, previously softened in hot water; it is easy to mould it upon the teeth with the fingers, whilst the thumbs, placed under the inferior border of the maxilla, antagonize their action. Injections of cold water solidify this mould sufficiently, thereby enabling me to withdraw it without distortion; six teeth are found nicely indentated in their proper relation with the alveolar arch.

I cut and fashion this small cast before restoring it, and subsequently confine it with my first metallic apparatus. Nothing more complete: exactness of contention, solidity, freedom of functional duties, all are united; the face has resumed its proper form and normal appearance, the patient eats on the same day bread and farinaceous diet.

14th. Sleep good. I am careful that every thing is in place; as additional precaution, I apply as a support to the chin, a bandage crossed on the forehead, whose turns are carefully gummed. Soft bread and vegetables for diet.

15th. The bandage is solidified by the gum, the gutta percha cast remains in position, the patient speaks and eats freely.

16th to 31st. Appearance and general condition of the patient remain satisfactory, and he takes nourishment easily; two or three times during the night he has complained of pain at the seat of fracture. The submaxillary swelling decreases daily; care is taken to tighten a little the screws.

Aug. 1st. Removal of the apparatus—the gutta percha mould is perfect, without odor or deformity—the teeth are on a level—no displacement in their thickness—slight vertical projection at the seat of fracture, formed by the provisional callus. The luxated teeth have regained their relative position and solidity. By the opposing action of the fingers on the fragments, a little mobility is detected in consequence of the softness of the callus. The apparatus is cleaned and replaced.

10th. Ten days having passed without discomfort or suffering, the apparatus is again removed—the callus has become solid, and the tumor which it previously formed is flattened—apposition of the fragments perfect—a gummed bandage is substituted for the apparatus, which the patient retains as a prudential measure, till the 17th of August, the day of his leaving the hospital.

Numerous reflections present themselves on a review of this case ; let us enumerate the principal.

The absence of lesions at the seat of fracture, and the violent contusion which involved the left angle of the inferior maxilla, naturally induce us to believe that the fracture took place by contre-coup, doubtless from excess of curvature impressed upon the bone.

The accident, originally simple, was soon followed by formidable complications ; persistent displacement, submaxillary phlegmonous abscess, in which the fragments were bathed, difficulty of speech and deglutition, all of which are explained by the intractability of the patient, the vertical direction of the fracture, the opposing tractions which the strong muscles impress upon the fragments, and finally, by the constant motion of those which subserve the necessity of breathing, drinking and spitting.

It is not surprising to see the patience and care of the surgeon fail; I congratulate myself, after having experienced such complications, when others were also doubtless to be expected, in having triumphed over them, and I willingly yield to the desire of making public the success of my plan, so as to spare my fellow practitioners the difficulties which I have experienced.

There is nothing more simple than the reduction and coaptation, by making use of a small stick for a lever, while the impression is taken in gutta percha ; the dental mould is obtained without trouble, and with an exactness which is measured by the coaptation.

The construction of the plates and the metallic apparatus to complete the dressing, and give it firmness and solidity, offers other difficulties ; they may be judged of by the methods which are detailed in the books, apparatus, of Rudenick, of Busch, of Arnzelot, &c., all very imperfect, and whose efficacy is very conjectural. That which I have employed requires an intelligent workman, but it is as simple in conception, as exact and convenient in application. After twenty-eight days application, the solidity of the callus permitted its removal, and the adjustment of the fragments left nothing to be desired; the two luxated incisors had resumed their position and solidity, ensheathed in the callus. No nervous symptoms were manifested, either in the direct track of the trifacial, or from sympathy with its principal branches; the general sensibility of the face, and special of the senses, also remained in their normal states.

Note.—Gramme, 15.438 grs. Troy. Centimetre, 0.39371 in. Millimetre, .03937 inch.

## ARTICLE XI.

## *On Filling Carious Cavities between the Back Teeth.* By Charles Woodnut, Dentist. Translated from the German, by W. A. Harris, M. D., &c. Baltimore.

It falls to the lot of the dentist to perform a large number of difficult operations, but among them all, there is no one which more frequently disappoints him, than the filling of such cavities as are found between the bicuspids and molars, particularly in the posterior space between the first and second molars. Moreover, precisely in that portion of his work which concerns the filling where it should be firmest, namely, in the upper part of the cavity nearest the gum and beneath the surface of the alveolus, he is apt to fail, because it is impossible for the operator to have a good view of the part, and because he has so small a space under the overhanging roof to manipulate, which is always the case, when the cavity is prepared according to the method delineated in the text-books, a method which has been received by the profession generally, but which is open to many objections; I refer to the operation by which room is secured by a V formed excision, and half the surface of the tooth is removed in such a manner as to prevent its restoration, so that a large portion of the tooth-bone will be deprived of its enamel and exposed to every external corroding agent with which it comes in contact.

The worst feature in this preparatory work, is, that the operator is unable either to examine thoroughly the cavity, or under the most favorable circumstances, to obtain but a very imperfect view; thereby will the success of the operation be so doubtful, that the inexperienced dentist will be undetermined whether to save the tooth or have recourse to immediate extraction. There is a method practiced by some dentists, but, as I understand, not generally known by the profession, which entirely avoids the evils alluded to. My attention will especially be given to the plan adopted by Dr. McQuillen.

With a sharp and strong chisel, that portion of the alveolus which overhangs or forms the roof of the cavity, is cut away, allowing the different soft tissues which connect the cheek, palate or tongue, (according as the tooth involved is above or below,) to remain. After the destroyed mass is removed, and a suitable form is given to the cavity, an artificial passage may be created of greater depth than it was above, so that the cavity from the surface of the alveolus to the neck of the tooth, may be gradually reached. If there be not sufficient room between the tooth and the one adjacent, to condense the filling and continue the work, the respective soft tissues mentioned above, according to the particular necessity, may be detached as far as is required.

The gold, as is usual with a cavity in the crown, is condensed from the alveolus, whilst the upper surface of the same is leveled as usual in these fillings, and assumes a slightly undulating form, so that it cannot easily be displaced by the action of the jaw. Care must be taken that the filling be well consolidated, whilst progress is being made from the bottom of the cavity to the external opening in the intermediate space; above this last the gold must be slightly spread out, to be subsequently condensed. The advantage of this method consists in this, that a cavity of which with great difficulty a limited portion could be seen, and in which there was a small space to manipulate, is changed into a simple crown cavity, most of whose points can be seen, and where in every case direct pressure can be made, so that a more perfect operation is insured, which promises eventual success. The great space, which in this manner is obtained from the jaw, for the benefit of the tooth, counts strongly among the arguments in favor of the operation.

Furthermore, when the pulp is involved posteriorly, the operator is enabled to reach the root with much greater facility and less sacrifice to the substance of the tooth, than by the adoption of any other method, than I have been able to discover.

In regard to this operation, it has been objected that more time and labor would be required to prepare the cavity by this mode, than in the older way; this should not be justly considered an objection if the dentist's duty is better fulfilled, and if, by sharp and properly constructed instruments, the work is finished with greater ease to the operator and more comfort to the patient, as well as in a shorter period of time, than by the old method of filling.

It may be permitted to me to say here a few words in regard to instruments. Many dentists, and particularly the young ones, are accustomed to use instruments which are much too small, and badly proportioned for use; a large heavy handle should not be attached to a small blade, nor a large blade to an insufficient handle. Our instruments must be strong and heavy, but in every case well proportioned. We sometimes use small ones, for instance, in cavities of the incisors, but much the larger portion should be more strongly constructed than those which are generally found in the pocket cases of dentists.

Of much greater importance is it, however, to have sharp instruments, so that our work may be conducted with the most speed, and the least pain for our patients. The dentist can have no excuse for using dull instruments whenever it is possible to obtain a whetstone.

## *Arsenic Eating.*

*Messrs. Editors:*

THE noise our papers are making about the eating of this surest of *poisons*, is, we take it, calculated to spread false notions concerning it. The inference is plain, that some parties having had occasion to use arsenic, found its effects pleasant, and continued its use until fear of its ultimate consequences induced them to suspend, when it was found impossible to be omitted, life itself depending upon its continuance. The whole matter must be a fabrication, for there is no approximation to a pleasurable sensation being derived from its use, as in opium or hatchis. That the idea of increasing one's embonpoint would induce any one to resort to this drug, is not true, because its effect after the system has become completely saturated, is simply to give a bloated appearance to the face only, and a bloodshot or inflamed appearance to the eye.

This is absolutely all it can effect, except the invariable consequences when continued, of griping, purging and nausea, and this following the largest dose safely administered of $\frac{1}{16}$ gr. per day.

Fowler's solution of arsenic, the form commonly used of this drug, contains 1.120 of a grain in every drop, and its dose seldom reaches five drops three times daily, or after eating. The whole matter has seemed to me so unreasonable and so widely diffused in the minds of the people, that I have felt justified in uttering a strong protest against it, as great mischief and sad consequences might result.

# ARTICLE XII.

## *Platina and its Accompanying Metals.* By MM. H. Sainte Claire Deville and H. Debray. (Translated from the French for the American Journal of Dental Science.)

(Continued from April No.)

### I.—Ruthenium.

*Physical Properties.*—After osmium, ruthenium is the most refractory metal of which we have any knowledge. It requires the most vivid jet to melt small quantities of it; and then it is necessary to place the metal at the distance of one or two millimetres from the extremity of the blowpipe, at the point where the heat is at its maximum, or the experiment will not succeed. During this operation the oxyd $Ru0_3$ is formed, which volatilizes, emitting an odor resembling that of osmic acid, and depositing a brown sublimate. Ruthenium, after being thus subjected to the oxydating flame is blackish brown upon the surface; it vegetates (*rocke*) like platinum and rhodium; it is brittle hard like iridium.

*Density.*—The density of ruthenium is the only property which we find distinctly characteristic of this metal, the color reactions not sufficing for the platinoid metals, one of which, iridium, may present them all. Ruthenium; separated from rhodium by the insolubility of its rose-colored salt, ($Ru_2$ $Cl_3$, 2Clk.,) by its insolubility in the molten mixture of nitre and saltpetre (*sic.*,) is distinguished clearly from iridium only by its density, which is clearly half that of iridium. The purest melted rhodium we have obtained, weighs from 11 to 11.4: it was dissolved a great many times in nitre and potassa, in which iridium becomes insoluble when ruthenium is much in excess, a fact which explains this method of purification.

*Preparation.*—We shall give in succession the widely different methods by means of which we have obtained ruthenium. Osmides in laminæ were selected and pulverized after having been alloyed with four or five times their weight of zinc, which is expelled by heat, employing, as we have already said, a carbon crucible properly protected. For this, the mixed materials are warmed, first to full redness for an hour, then to whiteness for two hours, till all the zinc vapor has disappeared from the flame. In the crucible is found a porous friable mass weighing precisely the same as the osmide originally introduced. Under the pestle, this mass is easily pulverized, except a small quantity of spangles which are separated by a gauze sieve. One part of this finely pulverized matter is mixed, with extreme care, with three parts of binoxyd of barium and one part of nitrate of baryta; the substance is introduced into an earthen crucible and kept for an hour at a temperature a little below the fusing point of silver. After cooling, the black friable mass is pulverized with the greatest care and introduced into a flask, provided with a ground glass stopper, and filled with a mixture of 20 parts of water and 10 of common muriatic acid. The flask is plunged in cool water to hinder the temperature from rising in consequence of the violent reaction. The newly prepared osmio-iridiate of baryta is added portionwise. This operation must be performed in a good draught, to prevent the small quantities of osmic acid carried off by the disengaged chlorine or oxygen, from diffusing themselves with these gases through the atmosphere of the laboratory. When all reaction is over, one part of nitric acid and then two parts of common concentrated sulphuric acid are added. The flask is then closed, shaken violently, and allowed to stand to deposit the sulphate of baryta. The liquid is decanted, the residue washed by decantation, and the mixed solutions distilled in a tubulated retort, till a fourth of their volume has passed over. The distillate is very rich in osmium, which is immediately precipitated by ammonia and sulphydrate of ammonia. The red liquid remaining in the retort is evaporated to a very small volume. Then two or three parts of sal ammonia are added portionwise and some cubic centimetres of nitric acid. It is evaporated to dryness at a temperature which should not much exceed 100 degrees (212°F.) There remains in the retort a dark violet crystalline precipitate, which is treated with a small quantity of water half saturated with sal ammoniac, and washed with this solution till it is no longer colored. The black salt (chloridiate of ammonia containing ruthenium) is introduced into a porcelain crucible and calcined gradually till the mass is brought to redness. It is well to enclose the porcelain crucible in an earthen one, and to introduce between the two some fragments of charcoal. The mixture of iridium and ruthenium thus obtained, is melted in a silver crucible, with twice its weight of nitre and its own weight of monohydrated potassa, and kept at a dull red for an hour or an hour and a half. It is digested with cold water and the yellowish orange solution of rutheniate of potassa is filtered off by means of a plug of amianthus put in the throat of a funnel. This liquid is treated by carbonic or nitric acid till some bubbles of carbonic acid, of nitric acid or binoxyd of nitrogen are disengaged and all yellow color disappears. It should exhale no odor of osmic acid. It lets fall a precipitate which is oxyd of ruthenium contaminated with a little silica. This oxyd is strongly calcined in a crucible of the coke from gas retorts,* and is melted with great precaution, by means of the oxyhydrogen blow-pipe already described, in a little cup hollowed out of a block of lime. If the ruthenium contains osmium, chrome or silica, these impurities are disengaged in vapors or in combination with lime.

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* When the ruthenium contains oxyd of chrome this is transformed in the crucible into brilliant and well crystallized carburet of chrome.

We give below the details of an operation of this sort:

| | Grammes. |
|---|---|
| Osmide from Colombia in spangles, | 34.10 |
| Mixed with zinc, | 150.00 |
| There remains after volatilization: disaggregated osmium, | 33.95 |
| Portion resisting pulverization, | 0.50 |
| Material employed in the operation, | 30.00 |
| Binoxyd of barium, | 90.00 |
| Nitrate of baryta, | 30.00 |
| Muriatic acid for solution, | 300.00 |
| Material escaping solution, | 0.00 |
| Murohydrated sulphuric acid for precipitation of the baryta, | 60.00 |
| Iridium and ruthenium oxydated, | 20.50 |
| Reduced by hydrogen, | 19.25 |
| Potassa, | 20.00 |
| Nitrate of potassa, | 40.00 |
| Ruthenium reduced and freed from silica, | 1.85 |

This ruthenium should be purified by one or more fusions with nitre and potassa, till the density is about 11.3

*Process by Roasting.*—It is known that M. Fremy has given a very elegant process for obtaining crystallized oxyd of ruthenium. But this process succeeds only with difficulty in a very numerous class of ores, which containing only a small proportion of ruthenium, furnish it in small quantities. It is manifest that in operating upon ores rich in ruthenium, this is the mode of preparation which should first be employed, in order to extract in a crystallized form, all that can be furnished by this process, the residue being afterwards treated by the methods we have just indicated. The processes by roasting, applied to ruthenium, are so simple, that to obtain specimens, we always employ them, when the osmides roast readily. When on the contrary, calcination is difficult, it is well, as we have said when speaking of the preparation of osmic acid, to treat the osmide of iridium with 7 or 8 times its weight of zinc, to dissolve out with muriatic acid all the excess of zinc, to calcine the powder to dull red in a closed crucible, and finally to effect the calcination at the temperature of the fusion of copper, on platina foil in a tube of porcelain. We have thus obtained fine crystals of oxyd of ruthenium in prisms with a square base of the form of oxyd of tin.

*Oxyd of Ruthenium*, $RuO^2$.—Thus obtained, this oxyd has a density of 7.2 and the following composition:

| | |
|---|---|
| Osmium oxydated, | 0.7 |
| Iridium oxydated, | 1.0 |
| Rhodium oxydated, | 1.0 |
| Oxyd of ruthenium, | 97.3 |
| | 100.0 |

This analysis was made by dissolving the oxyd in potassa and nitrate of potassa, and receiving upon the residues the same treatment till all coloration ceases.

This oxyd contains

| | Observed. | | Calculated. |
|---|---|---|---|
| Oxygen, | 22.3 | $O_2$ | 23.3 |
| Ruthenium, | 77.7 | Ru | 76.7 |

These are the results also obtained by M. Fremy. The immediate analysis of this oxyd shows plainly the cause of differences between the figures calculated for oxygen and those given by observation.

We call attention to the fact that all the colored reactions of ruthenium belong almost without exception to iridium, that the composition of the oxyd of ruthenium is such, that it might as well represent an oxyd of iridium, $IrO_4$ as the oxyd $RuO_2$, and that because the equivalent of ruthenium is plainly half of the equivalent of iridium ; we have shown that the oxyd of iridium dissolves easily in the mixture of nitre and of saltpetre (*sic*:) it was, therefore, indispensable to show that this volatilized oxyd was not a new degree of oxydation of iridium. We have accomplished this in the following experiments:

With this oxyd we have formed the rose-colored salt of M. Claus, which has given us by analysis, the following numbers:

| | Observed. | | Calculated. |
|---|---|---|---|
| Chloride of potassium, | 40.0 | 2ClK | 40.9 |
| Chlorine, | 30.2 | 2Cl | 29.6 |
| Ruthenium, | 29.7 | 2Ru | 29.5 |
| | 99.9 | | 100.0 |

The metal roasted in the air becomes the protoxyd, which has the following composition:

| | Observed. | | Calculated. |
|---|---|---|---|
| Ruthenium, | 85.9 | Ru | 86.8 |
| Oxygen, | 14.1 | O | 13.2 |
| | 100.0 | | 100.0 |

Finally, after all these experiments, the metal which was disengaged from this last compound, had a density very near 11.3*, which characterises it in the most precise manner, for iridium weighs, 21.15.

Furthermore, we call attention to the fact that the density of the molten matter is the best criterion of the purity of ruthenium. The mixture of potassa and saltpetre dissolves so many substances different from ruthenium, that to be sure we have impure ruthenium, we are obliged to have recourse to this method of verification. It is thus that ruthenium not purified gives variable densities, ranging from 17 to 14† and is never free from iridium. Fur-

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* This density, taken upon a very small quantity of material, can only serve as a verification.

† The ruthenium of density 14 contains

| | |
|---|---|
| Ruthenium, | 88.7 |
| Iridium, | 11.3 |
| | 100.0 |

ther, if we take, as we have done, osmides in grains entirely free from ruthenium, and attack them by the mixture of nitre and potassa, we obtain a deep blue liquid from which is easily extracted a metal, which, melted and refined, has a density of 21.15, like pure iridium. Thus in attacking 32.3 grammes of metallic iridium from osmium, in grains, we have obtained 4.43 grammes, or 14 per cent. of a metal soluble in the alkaline flux, which after fusion weighed 21.2. It possesses besides all the colored reactions of iridium.

*Alloys of Ruthenium.* Zinc forms with ruthenium an alloy which presents itself under the form of hexagonal prisms, probably regular, formed at the end of an almost complete evaporation of the zinc. This alloy takes fire in the air and burns with feeble deflagration. Its composition could not be determined for want of material.

The alloy of ruthenium and tin crystallizes in cubes, the angle of which has been found to be exactly 90 degrees. It is perhaps the finest alloy which can be produced ; comparable to the finest specimens of crystallized bismuth, in the beauty and size of its crystals. It is very easily prepared. It is sufficient to heat to redness in a charcoal crucible, ruthenium with ten or fifteen times its weight of tin, and to attack the cooled matter by muriatic acid. We find a geode of superb crystals, the composition of which is

| | | | |
|---|---|---|---|
| Ruthenium | 33 | Ru | 31* |
| Tin | 67 | 2Sn | 69 |
| | 100 | | 100 |

We cannot conclude these remarks without rendering homage to the sagacity and precision with which the discoverer of ruthenium, M. Claus, has treated this subject, on which he would have left nothing to be done, if he had

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* The ruthenium employed was not pure enough to hope for more closely corresponding numbers.

had at his disposal the dry methods which we have employed almost exclusively. Still we know by experience how difficult this subject is, especially when it is wished to obtain results as precise as those which are to be found in the beautiful memoirs of M. Claus.

## II.—PALLADIUM.

Palladium is the most fusible of all the platinoid metals. The furnaces which serve for the fusion of platinum bring it to the liquid state with extreme facility. When we subject it, by means of an explosive gas blowpipe, to the temperature of fusion of iridium, it disappears in green vapors which condense into a dust of a bistre color, a mixture of the metal and its oxyd.* This experiment should be made in a little cupel sunk in a piece of quick lime.

Palladium, heated in contact with the air and kept in fusion in an oxydating atmosphere, vegetates like silver at the moment of its solidification. The oxygen disengaging itself only at the moment when the upper layer of the metal is fixed, the button which has vegetated is cavernous although its surface is perfectly regular. Palladium, closely allied to silver, is more oxydizable at a low temperature. Its surface is always tarnished by a very slight layer of oxyd.

When we wish to make with palladium the experiment of the flameless lamp, we must begin by heating its surface in the reducing flame. These experiments succeed very well, if a plate of palladium is put in a current of illuminating gas mixed with air, as it comes from the metallic gauze of a common lamp. With this lamp the metallic lamina is warmed, then the flame is extinguished by turning off the gas. Some moments after, the metal being still a little hot, the gas is let on and the palladium becomes incandescent.

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* When we subject silver to so elevated a temperature, taking care to maintain the oxygen in slight excess in the flame, we see the silver boil like mercury and disappear in fumes of oxyd, which can be condensed on the fragments of the crucible or on the lime in which the little cup has been scooped out for the experiment. The oxyd of silver thus produced is clear yellow, like a sublimate of lead, but not so deep in tint.

The density of pure palladium, melted and not hammered, is 11.4 at the temperature of 22.5° (75.5 F.)

*Alloys of Palladium.* Palladium is soluble in zinc, but does not combine with it: for, after the action of muriatic acid on an alloy of zinc and palladium, only palladium is found. With tin it is otherwise. On melting palladium with six times its weight of tin, heating to redness, cooling and digesting with muriatic acid, there remains a compound crystallized in fine brilliant laminæ, which has the following composition:

| | | | |
|---|---|---|---|
| Palladium | 57.4 | $Pd_3$ | 57.4 |
| Tin | 42.6 | $Sn_2$ | 42.6 |
| | 100.0 | | 100.0 |

Silver and copper, which have a great analogy with palladium, give by this process alloys with tin altogether similar in form and composition.

| | | | Calculated. | | | | Calculated |
|---|---|---|---|---|---|---|---|
| Silver | 73.7 | $Ag_3$ | 73.3 | Copper | 44.8 | $Cu_3$ | 44.9 |
| Tin | 26.3 | $Sn_2$ | 26.7 | Tin | 55.2 | $Sn_2$ | 55.1 |
| | 100.0 | | 100.0 | | 100.0 | | 100.0 |

## IV.—RHODIUM.

It is easy to get rhodium by attacking the residues of platina by any process and especially by that of M. Woehler, that is to say, by means of chlorine which has been made to act on a mixture of common salt and the residues, precipitating the iridium by sal ammoniac, and searching for the rhodium in the soluble products.

Rhodium reduced by hydrogen should be purified in the manner we shall presently describe. The following is the complete process we recommend.

There is among platina residues a particular substance in which it is best to look for rhodium. It is that which is obtained in workshops when the mother waters, from which platina has been thrown down, are precipitated by iron. We shall presently give, in the chapter on platina residues, the composition of these substances. We shall content ourselves, at present, with describing the general process by which we extract pure rhodium from every variety of residue. We begin first by melting these residues with their weight of lead, and twice their weight of litharge. When the crucible in which the operation is performed is thoroughly red, the litharge completely liquid, it is agitated once or twice and suffered to cool slowly. The wedge of lead is then withdrawn and thoroughly cleaned ; it contains all the less oxydizable metals belonging to these residues. The lead is attacked by nitric acid diluted with its weight of water, which dissolves the lead, the copper and the palladium. The pulverized metallic substance which remains is well washed, then mixed with extreme care with five times its weight of pulverized binoxyd of barium which is exactly weighed. The mixture introduced into an earthen crucible, is kept at redness for one or two hours, taken up by water, then by aqua regia which expels a great quantity of osmium that is lost, or may be recovered by distillation in the state of osmic acid. When the liquid has lost all odor, a quantity of sulphuric acid is added, sufficient wholly to expel the baryta from the mixture of the chlorides. It is boiled, filtered, evaporated, with the addition at first of a little nitric acid, and then, at the end of some time, of a great excess of sal ammoniac. It is evaporated to dryness by warming it to 100° (212° F) and washing with a concentrated solution of sal ammoniac, which carries off all the rhodium, the washing being continued till the wash waters are no longer sensibly tinted with rose. The filtered liquor is evaporated with a great excess of nitric acid which destroys the sal ammoniac, and, when there remains only the salt of rhodium, the evaporation is finished in a porcelain crucible. The dry matter is moistened with a little sulphydrate of ammonia, and mixed with three or four times its weight of sulphur. The porcelain crucible with its cover on is then introduced into an earthen crucible and the interval between the two is brasqued. The whole is heated to bright redness and there remains in the crucible metallic rhodium, which may be considered as very nearly pure when it has been for a long time boiled successively with aqua regia and concentrated sulphuric acid.

To obtain rhodium with the properties we are about to describe, it must undergo another purification. Indeed, this rhodium forced up by the hammer, exhibits well the equivocal malleability attributed to it; but once melted, it will lose it almost entirely in consequence of the incorporation into the entire mass of the impurities mechanically mixed with the metal. To obtain irreproachable rhodium, it is mixed with three or four times its weight of zinc, melted at dull redness, thoroughly stirred, then left awhile to rest and poured out. At the moment when the alloy is made, there is developed such a heat that a part of the zinc may be volatilized; the crucible must then be covered with the greatest care. The alloy treated with concentrated muriatic acid, gives up much of its zinc, leaving a crystalline substance which is nothing but an alloy of definite proportions of zinc and rhodium. This is dissolved in aqua regia; the solution treated with an excess of ammonia to complete or nearly complete solution of the precipitate.* After ebullition for some time and a proper evaporation, the yellow salt or chloramidide of rhodium* is obtained. This, after two or three crystallizations, and calcination with a little sulphur in a charcoal crucible, at a high temperature, gives pure, agglomerated rhodium which may be then melted without loss.

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* This mode of preparation by ammonia and crystallization of the chloramidide of rhodium is applicable to all solutions of rhodium containing little iridium. The zinc which we add to the rhodium to facilitate its solution is a

The fusion of rhodium can be effected either by means of the blow-pipe we have described and a little cupel in lime, or in the lime which answer for the fusion of platina and which will presently be described.

Rhodium melts less readily than platina, so that the same fire which liquifies 300 grammes of platina, can fuse in the same time only 40 or 50 grammes of rhodium. We have observed no appearance of volatility in this metal; but it oxydates very superficially like palladium and vegetates in the same manner. The surface of the button is often bluish. When the rhodium has been thus melted in contact with lime, it is deprived of the silicium which always accompanies it and of the osmium of which the last traces disappear only at a very high heat, and it acquires physical properties eminently utilizable. Less white and less brilliant than silver, it has nearly the same tint as alluminium. It is ductile and malleable, but only in a condition of great purity, at least after fusion. This is a test which the rhodium we find in commerce does not always stand, and which nevertheless in the state of condensed sponge seems capable of being worked with some facility.

The density of pure molten rhodium is about 12.1.

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volatile reagent which will not resist the action of fire, when the rhodium is melted; so that we need not trouble ourselves about its possible presence in the yellow salt which has been crystallized two or three times.

* The analysis of this salt gives us the following results which confirm the analysis of M. Claus.

| | Found. | | Calculated. |
|---|---|---|---|
| Rhodium | | 2 Rh | 35.2 |
| Chlorine } | 34.6 | 3 Cl | 36.0 |
| Ammonia } | 65.4 | 5 $NH_3$ | 28.8 |
| | 100.0 | | 100.0 |

*Alloys.*—The alloys of rhodium, at least those which we have examined, are very curious in the fact that they are true chemical compounds, as the high temperature developed at the moment of their formation might have led us to suspect.

We have already described the preparation of the crystalline alloy of zinc and rhodium. It resists the action of muriatic acid; but it is a remarkable fact that upon the contact of air with the acid, there is soon a well marked rose tint, revealing an oxydation of the two metals under the double influence of the air and the acid.

Its composition is

| | | | |
|---|---|---|---|
| Rhodium, | 43.7 | Rh. | 44.5 |
| Zinc, | 56.3 | $Zn_2$ | 55.5 |
| | 100.0 | | 100.0 |

In the same manner is prepared an alloy of rhodium and tin. Muriatic acid leaves a brilliant black crystallized substance, fusible at a high temperature, and easily analyzed by means of the action of chlorine, which transforms it into volatile chloride of tin, capable of being weighed as stannic acid and rose-red chloride of rhodium, which is fixed, insoluble in aqua regia, and having the composition RhCl.: this can be weighed as metal by reducing it with hydrogen. We give the following results:

| | | | Calculated. |
|---|---|---|---|
| Tin, | 53.2 | Sn. | 53.1 |
| Rhodium, p. d. | 46.8 | Rh. | 46.9 |
| | 100.0 | | 100.0 |

## V.—PLATINA.

After palladium, platina is the most fusible metal of the group. Once melted, if the temperature is much raised and its action on the button prolonged, the metal sensibly volatilizes. It presents, at the moment of its solidification, the phenomena of vegetation, which heretofore has been observed only for silver. To make platina vegetate, the operator must keep in fusion in lime for a long time a mass of at least 500 or 600 grammes, and rapidly uncover the metallic bath. When allowed to cool slowly, platina does not vegetate.

The best method of procuring pure platina is to melt and *refine* it in lime. We find in commerce platina of the second and third solution which is almost free from iridium, but which always contains traces of osmium and a little silicium. Fusion in lime in the oxydating flame perfectly refines it; osmic acid is liberated and the silicium passes into the state of silicate of lime, which melts to a colorless pearl that is seen to move rapidly over the surface of the metal till it reaches the edge, and is absorbed by the walls of the furnace.

Melted platina is a metal as soft as copper, as has been fully proved at the Paris mint: it is whiter than common platina, and does not possess that porosity which has hitherto hindered the fabrication of an impermeable vessel of platina.

Melted platina still possesses the property of condensing gases on its surface, and producing the phenomena of the flameless lamp.

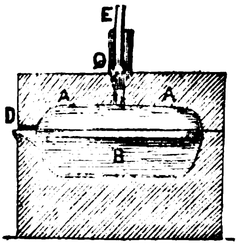
Its density is 21.15; less than that of ordinary platina which has undergone, in working, very powerful crushing.

*Fusion of Platina.*—We are about to describe that apparatus with which we have succeeded in melting platina, while operating upon quantities relatively large, and casting it in an ingot-mould, like metal of ordinary fusibility.

The combustible we used most frequently is illuminating gas. Hydrogen, which, at least when pure, gives a still greater heat, may also be employed. The combustion is fed by a current of oxygen, and the distribution of the gases is accomplished by the blow-pipe, (fig. 2,) which we shall not again describe. We shall only remark that to melt sufficient quantities of platina, 12 or 15 kilogrammes for example, that the stop-cocks of the apparatus, especially that which carries the coal-gas, should have a considerable section, leaving a square centimetre, or at least 75 square millimetres for the passage of the gas. The platina *tip* of the blow-pipe, or rather the hole by which the oxygen escapes, should be at least two millimetres in diameter. The oxygen ought to be under a pressure of from four to ten millimetres of mercury.

The furnace (fig. 3,) in which the combustion is made, is lime encircled with threads of iron. It is composed of two parts: 1st, the dome A A, cut in a cylindrical piece of lime, slightly arched at its lower part and pierced with a conical hole, where the blow-pipe C E enters: second, of a sole B, hollowed in another cylindrical piece of lime. This should be so deep that the molten platina may occupy a thickness of at most three or four millimetres. At the anterior part D, which should slightly protrude, a groove slightly inclined inward, is made with a file. This ought at the same time to serve as a spout for pouring, and an outlet for the flame. To effect a fusion, the different pieces of lime constituting this apparatus, are arranged in the manner represented in the figure; then holding the blow-pipe in the hand, the stop-cock H, (fig. 2,) is opened, and a feeble current of combustible gas allowed to pass, and then, by turning the stop-cock O, sufficient oxygen is let on to burn it. The flame is introduced through the hole P, so as to avoid a slight explosion which might scatter the lime of the apparatus. The walls of the furnace are gradually heated by slowly augmenting the rapidity of discharge of the gas, till the maximum of temperature has been obtained. With a piece of platina foil introduced at D, (fig. 3,) and placed under the jet of gas, we can ascertain the point of maximum temperature,

Fig. 3.

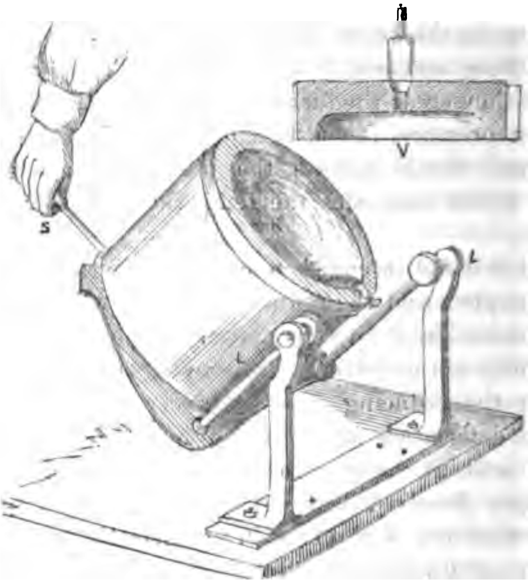


that is, the point at which fusion goes on with greatest rapidity; this is lowered or raised as required by managing the screw P, (fig. 2,) and lowering or raising the orifice of the platina tip which lets in the oxygen. The screw is kept steady and platina gradually introduced at the aperture D. If the platina is in small scales of less than a millimetre in thickness, there is scarcely time to introduce them. They are seen to disappear and melt almost the moment they enter the furnace. The oxygen should have a certain pressure, (about four or five centimetres of mercury,) and should agitate the platina with a gyratory motion, which regulates the temperature throughout the mass.

When it is not intended to cast the platina, the fusion being complete and the refining finished, which is known by the formation of vitreous matter on the surface ceasing, the rapidity of the current of the two gases is diminished, allowing the reducing gas to be very slightly in excess. This gas determines a very rapid formation of water or carbonic acid, at the expense of the combustible gas and the oxygen dissolved in the platina, and then a very perceptible ebulition is observed in the metallic mass. Gradually the solidification is effected even to the centre, and the fire is entirely extinguished. There is always a projection of platina towards the roof of the furnace, but this is easily collected after the operation.

When the platina is to be cast, an ingot mould is prepared either of thick cast iron well rubbed with plumbago, or of coke of gas retorts, or of lime. The last are made very readily of separate pieces of the material bound with iron wire. The vault is removed, the bed seized with the pincers, and the platina leisurely poured out like ordinary metal. The only difficulty (and that practice enables us to surmount) is to distinguish the dazzling surface of the platina and the open mouth of the mould, so as to pour steadily. The attempt should never be made to cast more than three or four kilogrammes at once. The danger is too great, should the pincers or any other part of the apparatus give way. It is necessary (as we have done when operating upon 12 kilogrammes of platina at a time) to use a furnace (see fig. 4) constructed according to the principles

Fig. 4.



we have just described, but composed, on account of its size, of pieces of lime arranged like bricks in a cylindrical apparatus of iron plate, in which they are readily disposed, the sole K being afterwards scooped out. The vault V is composed of several pieces of lime bound by a very solid circle of iron, supplied with a pressure screw; when the pieces are well set and tightened, the surface of the vault is dressed and the hole Q pierced with the greatest facility. The sole contained in the cylinder of iron plate K turns on a hinge about two supports LL, so arranged that the horizontal line joining the hinges, passes through the taphole D, so that when it is lifted by the handle S, attached to the iron cylinder, the whole apparatus turns about the line

LL, and the liquid on the sole of the furnace, runs into D, without displacing the point D itself. This very simple little manœuvre can be practiced by filling the sole with mercury, and pouring out this metal before trying melted platina. The principles upon which we base our apparatus are very simple.

1. Lime is perhaps the worst known conductor of heat, so that through a thickness of, at most, 2 centimetres, the apparatus being full of molten platina, the exterior is hardly 150 degrees, (302° F.)

2. Lime is the body which radiates heat and light with greatest perfection, whence it has been selected for the Drummond light. These are, therefore, the best walls that can be selected for a reverberating furnace of this kind.

3. Lime acts on all impurities which we need to separate from platina, such as iron, copper, silicium, &c., and transforms them into fusible combinations which penetrate its porous substance. It acts like a cupel, the substance of which purifies the metal melted in it.

An experiment made in the laboratory of the normal school with gasometers of 1400 to 1500 litres of oxygen and illuminating gas, by means of the apparatus with hinges, gave the following results :

In forty-two minutes, in which is comprised the time necessary for the determination of the proportions of gases necessary, and the trials inseparable from the manipulation of an apparatus which was not yet thoroughly understood, we have melted 11.595 kilogrammes of platina Russian coin. After the fusion it was necessary to refine the metal, which contained a little osmium and notable quantities of silicium, and then to run it in an ingot-mould of gas-coke, where it was kept liquid a considerable time. The amount of oxygen used was 1200 litres and the loss of weight in platina 135 grammes, half of which consisted of mechanical losses by projection during the pouring, so that the real loss is estimated at ½ per cent. at most, of the weight of platina; which corresponds very nearly to the impurities contained in the metal.

Thus, including refining, each kilogramme of platina requires for its fusion 100 litres of oxygen gas. But the refining requires almost as much as fusion; for in experiments of this kind made with very pure platina belonging to M. Savard, operating on three kilogrammes, a quantity already too small for such a determination, the amount of oxygen necessary to melt each kilogramme of platina, was only sixty litres.

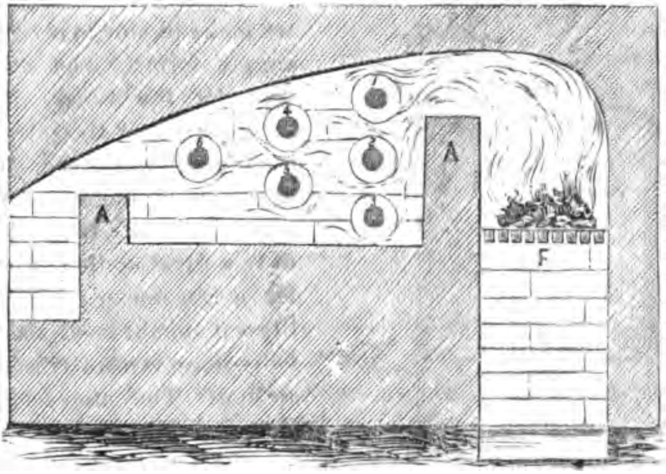
The casting of platina requires the same precautions as that of silver. According to the trials made with the tools of M. Savard and his platina, which we have often melted, (thanks to his very obliging disposition,) we have had with the same material badly formed ingots, malleable, but blebby, and often an unobjectionable substance, comparable to the softest metal. There is, therefore, in this operation a slight of hand necessary for certain success. This is only to be obtained by practice.

We have prepared oxygen by means of binoxyd of of manganese and mercury bottles which we heated in a little reverberatory furnace, (fig. 5,) with a thick layer of coal as caking as possible, to avoid burning the bottles by enveloping them in a very smoky flame.

Each mercury bottle (1, 2, 3, 4, 5, 6,) contains five kilogrammes of manganese; it lasts almost indefinitely when properly managed. After being charged, it is placed in the reverberatory furnace, horizontally or vertically, at will. Suppose it is charged horizontally—an iron tube somewhat conical at one of its extremities, driven by a mallet into the opening of the mercury bottle, and luted with fire clay, conducts, through caoutchouc tubes, the oxygen gas into a little copper receiver (fig. 5) containing water, and receiving the tubes coming from the mercury bottles, so as to isolate them from one another by means of the layer of water which the gases are forced to traverse. On the lateral and upper part of the receiver, a tube first horizontal and then slightly inclined, carries the gases and condensed water into a flask full of slacked lime or of a solution of caustic soda, in which the oxygen loses its carbonic acid. This vessel ought to be cooled if the receiver is not, because the water which the peroxyd of manganese, arriving there as steam, might heat it excessively. Thence the gas passes into the gasometer full of water, of which the discharge is so regulated that the pressure ought always to be some centimetres of water higher than that of the atmosphere.

The form of the reverberatory furnace, which we employ at the normal school is so simple that there is no need to describe it. Fig. 5 will answer in place of a description.

Fig. 5.



We shall only observe that the three first bottles, (1, 2, 3,) ought to be close together to diminish as much as is required the rapidity of the flame. The first bottle should nearly touch the vault; the second, placed on the same vertical line, ought to be very near the first, and the third should only leave between it and the sole of the furnace the space necessary to give passage to nearly all the flame. After this the three others are regularly disposed in the remaining space. It must always be remembered that the flame and heat tend always to rise, and that our object should always be to keep them down.

FIG. 6.

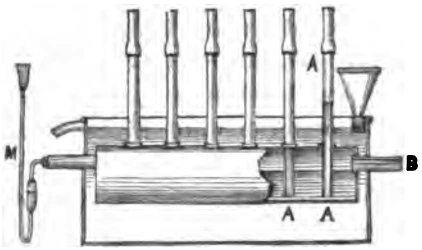
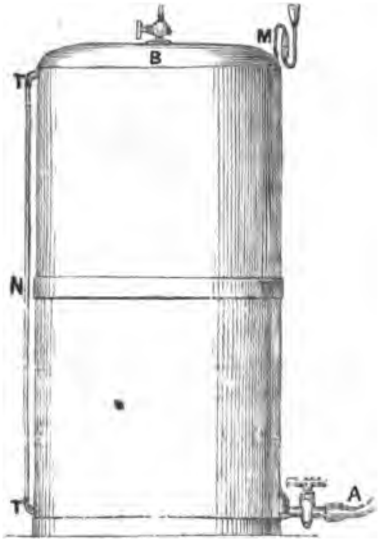


Fig. 6 indicates the disposition of the receiver with its tubes, A A, for the admission of the gas; the hole of exit, B, which determines the level of the water, and the manometer M, which gives the pressure of the gas. It is cooled by a current of cold water.

Fig. 7 gives the construction of our gasometers which we make of zinc in a very simple form. The exit pipe for the water, A, serves also for the introduction of the water to drive out the gas, when it is to be used. It should have a great section; and for a gasometer of 800 litres it should be at least two square centimetres in section. The stop-cock, B, serves also alternately for the introduction and the exit o

FIG. 7.



The manometer, M, contains mercury, and indicates the pressure while the gasometer empties itself. Finally a glass tube, N, connected by caoutchouc tubing with two little lateral tubulures, TT, communicating with the interior of the gasometer, allows us to determine the level of the water.

The price of the oxygen is very easily calculated: 100 kilogrammes of German manganese of 75 per cent. costs 26 francs, and it is best to take this highly esteemed article, because after having served for the manufacture of oxygen, the manganese being as good if not better than before for the glass makers, can be sold for 10 francs the 100 kilogrammes, which makes little more than 17 francs per 100 kilogrammes of manganese. According to our experiments, 25 kilogrammes of manganese at 26 francs, give 1500 litres of oxygen, or 100 kilogrammes of manganese gives 6 cubic metres or 8.6 kilogrammes of oxygen.

It is seen that in practice we have obtained about the third of the oxygen which 100 kilogrammes of manganese at 75 per cent. (or 75 kilogrammes of pure manganese) contain, that is, very nearly the theoretic quantity. We have used very rich specimens of manganese, and dearer in proportion than the poor manganese, which it might be better to employ, because the heating and the vessels have a very low value, relatively to the price of manganese. According to these experiments, every cubic metre costs three francs, reckoning the manganese at 17 francs the 100 kilogrammes, and rating at a high price the fuel, the vessels, &c., we get four francs the cubic metre. The cost of fusing a kilogramme of refined platina will therefore be at most 40 centimes, and a kilogramme of pure platina, 24.

The quantity of illuminating gas employed to melt 11.590 kilogrammes of platina, was only a few hundred litres, so that it need not be taken into account, especially when the figures cannot be more exact than is common with laboratory experiments on a small scale.

If hydrogen is used, we have said we get a higher temperature. We prepare the hydrogen in an apparatus of Desbassayns of Richmond, containing 60 litres, in which are placed 100 kilogrammes of zinc, by means of a flask, or balloon of glass or of earthenware tubulated below, containing 50 or 60 litres, and exactly filled with scraps of zinc. A tube carries sulphuric acid to the top of the zinc, and the sulphate of zinc runs out through a tube of copper provided with a stop-cock, also of copper, which must be washed after every operation. The opening of this stop-cock is so regulated that the saturated solution of zinc, after having traversed the layer of metal in the balloon, cannot accumulate in it. A glass tube, communicating above and below with the interior of the balloon, gives the level of the liquid which it contains. The balloon should be constantly sprinkled with cold water, to hinder a rise of temperature. This point is very important. To the cork in the upper part of the balloon is adapted a curved tube, plunging into an eprouvette full of water, and 20 or 30 centimetres high. It is a safety valve through which the hydrogen escapes, when its discharge is suspended or even retarded. The hydrogen generator may be lead, or copper sheathed in lead. It is well, then, to plunge it entirely in a great trough of water, which is constantly renewed. It is necessary, at all hazards, to prevent the water condensed in the tubes which bring the gas to the blow-pipes, from remaining there, as it would occasion oscillations in the pressure, the effect of which would be very injurious to the operation. We repeat it again—all the stop-cocks, all the channels for conducting the different gases, should be of a large section.

The method which we have just expounded, applied to the revivification of old platina, gives excellent results. No foreign metals, except iridium and rhodium, can exist in the platina after it has been melted and refined by the processes which we have described. All the substances which most easily attack platina, sulphur, phosphorus, arsenic, the gold with which it is soldered, iron, copper, palladium, osmium, are separated either by oxydation and absorption by the lime, or by volatilization.

Platina containing gold and palladium, allows these metals to escape as vapor, and they can be easily collected again by carrying the products of combustion through an earthen channel, where all the volatile foreign matters are deposited, except the osmic acid, which is condensed, if a vessel full of ammonia is placed in the current of the vapors. Besides, a part of the osmium is deposited in the tube in the metallic form, being either volatilized in the current of flame, or reduced in the tube of condensation from the osmic acid produced in the furnace.

The form of the furnaces which we have employed might be slightly modified, for example, made elliptical or rectangular, if the fusion were to be accomplished by two blowpipes. It is evident that the quantities of platina which can be melted are unlimited; which has struck all persons who have assisted at our experiments, and who have proved with us that platina is very easy to melt, to run, and even to cast; for platina remains a long time melted in a lime mould previously heated to 500 or 600 degrees. Besides, platina can be melted in separate furnaces, containing 25 to 50 kilogrammes, and poured out at the same time into the same mould, as is done with steel. We only recommend never to give more than 4 or 5 centimetres of thickness to the bath of platina, or at least, that it should be continually agitated either by the blast of the blowpipes, or by stirrers of well burned lime or magnesia, because platina is not a sufficiently good conductor to remain perfectly liquid under a greater thickness. Otherwise, we might fail in refining or even in fusing the metallic mass.

*Alloys of Platina.*—Tin and platina form an alloy well crystallized in cubes, at least in rhombohedra, the angles of which are very nearly 90 (the faces have always little lustre;) their composition is expressed by the formula.

| | Observed. | | Calculated. |
|---|---|---|---|
| Platina, | 52.9 | $Pt^2$ | 52.6 |
| Tin, | 47.1 | $Sn_3$ | 47.4 |
| | 100.0 | | 100.0 |

It is obtained by melting platina with six times its weight of tin, allowing it to cool slowly, and dissolving in muriatic acid the excess of tin, which leaves the alloy of platina in very beautiful and elegant geodes.

The alloys of platina with the common metals * have almost all been studied, and offer but little interest. Zinc appears to combine with platina, and form a crystallizable alloy, which is obtained by melting platina with an excess of zinc, and attacking by muriatic acid, which dissolves the excess of zinc. It is very difficult to hinder a little platina from escaping the action of the zinc, whence, in our analysis, the platina has always been found in excess over the numbers which the formula $Pt_2$, $Zn_3$ gives, showing its composition to be,

| | |
|---|---|
| Zinc, | 30.4 |
| Platina, | 69.6 |
| | 100.0 |

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* The metals of platina being infusible by methods hitherto adopted, it has been impossible to make serious attempts to obtain true alloys with them. Still, M. Chapuis has shown us an alloy of platina and rhodium from the aggregation of sponge, and appearing homogeneous; we have melted it much more easily than rhodium. After refining, which carries off silicium and a little osmium, the alloy is easily worked. According to the observations of M. Chapuis, it is not attacked by *aqua regia*, which makes it one of the most precious materials for the manufacture of certain chemical vessels. This alloy ought to contain 30 per cent. of rhodium. The other alloys will be described hereafter.

[To be Continued.]

# SELECTED ARTICLES.

## ARTICLE XIII.

*Notes relating to the Extirpation of the Parotid Gland.*—By Daniel Brainard, M. D., Professor of Surgery in Rush Medical College.

The discussion of the question of the possibility and utility of extirpation of the parotid gland will seem at first sight to imply a degree of ignorance on the part of the profession in the region in which it occurs incompatible with a respectable degree of anatomical and surgical knowledge. Nevertheless, here, as elsewhere, it is rather the result of personal objects than of scientific zeal, raised for the purpose of pulling down a school or an individual, rather than to establish any new doctrine in surgical practice. Hence I might be expected to pass it by in silence, but the discussion of any question of science is so much more agreeable than the combatting of stale notions relating to medical politics, that I choose to regard it in a serious light, and treat it as if we were still at a period when the common carotid artery had never been tied, nor the the upper and lower jaw been removed.

Prof. Granville Sharp Patteson, in a lecture delivered January 22d, 1833, p. 9, says: "If after I shall have shortly stated the facts which the progress of surgery has, within the last few years furnished, to establish the practicability and safety of extirpating a diseased parotid gland, the possibility of performing this operation should be doubted even by a junior student, I shall only say that his case is hopeless."

Professor Mutter, in his Notes to Liston's Surgery, 1846, p. 311, says: "During my recent visit to Europe, being anxious to ascertain the estimate placed upon the measure by the best authorities there, I made the subject one of diligent inquiry. I discovered that much difference of opinion existed as to the utility of the operation, but I found none who doubted the possibility of its execution."

Vidal says, "the question (of the possibility of the extirpation of the parotid gland) in my judgment, need not be discussed at the present day." Traite de Pathologie Externe, vol. 4, p. 71.

Prof. Gross, in his recent work on surgery, says it is folly to deny the possibility or the propriety of extirpating the parotid gland, at the present day.

Notwithstanding these opinions, there are still those who persist in discussing this opinion, as if it had never been settled, and recently the surgical and anatomical departments of the Lind University have chosen this as the point of attack upon the veracity and professional skill of the writer of this article. Without, therefore, taking time and space, which might better be devoted to other points, I propose to lay before the profession those facts well known and accessible to all, and of which no surgeon should be ignorant, showing the perfect practicability of the operation.

I do not propose to discuss its utility except incidentally. There are some who dispute the utility of removing the female breast for cancer. The general practice of the profession is against them, although their reasons are strong, quite as much so as those which could be urged against the same operation on the parotid gland.

The question of its removal is one of indication only.—There are many cases in which the gland is involved, in which no operation should be thought of. I have myself seen two cases of the kind in which no operation was advised.

I certainly should hesitate to undertake the operation in cases so formidable as those in which Profs. Goodlad, Carmichael, Klein, McClellan, and others, operated successfully.

But in other cases where the disease is more limited, the operation, although formidable, is by no means excessively difficult in its mechanical execution. Cases of this kind are sometimes met with, and they are described by Nelaton as the most common form of cancer of the gland.

"The tumor remains for a long time small, indolent, and of a stony hardness: it is fixed as if wedged in the parotid notch. It presents no inequalities on the surface, and no alteration of the skin. It is developed from above downward, and its greatest diameter is transverse."

"This tumor increases but slowly, and it is but rarely, according to Boyer, that it quickly acquires a large size, and that it gives rise to the sensations peculiar to cancer," *Elements de Pathologie Chirurgicale*, tona 2, p. 725.

The objections to the reports of the removals of this gland date from an early day, before the ligature of the carotid artery was thought of, and when the danger of wounding the external carotid was sufficient to deter surgeons from undertaking an operation. They are mostly anatomical, and refer to the deep situation and important relations of the organ. Experience has sufficiently demonstrated the fallacy of such objections. There is no wound fatal to life necessarily made in removing the parotid gland.

Critics have objected that reports of this operation often state that there is little hemorrhage, which, it is alleged, is inconsistent with the idea of its extirpation. Now the principal artery involved in tumors of the gland when of small size, is the continuous trunk of the external carotid, which divides higher up into the temporal and internal maxillary arteries. Owing to anomalies this may be deficient, or of small size, but even if of its usual dimension, it does not necessarily give greater hemorrhage; firstly because the surgeon, knowing its situation, may secure it by ligatures before dividing; secondly, because an artery of that size, when torn across, gives little or no blood. This was noticed by Dr. George McClellan in one of his cases. If any not familiar with such operations doubt of this let them refer to the effect of torsion of the arteries or to those cases of which four or five are now on record in which avulsion of the arm and scapula was produced by mechanical force, the subclavian and axillary arteries, giving little or no blood when thus torn across.

The amount of hemorrhage will, in such an operation, depend upon the vascularity of the parts and the size of the tumor. I have removed about twenty tumors from the region about the angle of the jaw, including several of portions of the jaw itself. Of these, two only were for disease of the gland.

In some of these operations the bleeding was profuse, much more so than in the two for removal of the gland itself. McClellan states the same as true of his experience. He removed the gland eleven, and other tumors situated in connection with it, thirty times.

The manner of performing the operation also influences the loss of blood. By tying the large arteries before dividing them, and making the dissection with a blunt instrument, large tumors may be removed without great hemorrhage.

Another objection to the reports of such operation is the neglect to state that the facial nerve was divided, or that paralysis occurred. Now, if in any such operation, the face were stated not to be paralyzed, or the external carotid artery, not to be divided, I should doubt if the parotid gland could have been removed, notwithstanding it may be taken away in the healthy state on the dead subject and leave both these parts. But the neglect to give a full description of an operation does not altogether discredit it, and after the division of the nerve the paralysis gradually disappears or diminishes, probably from other nervous branches supplying its place. This has been noticed by Sir Astley Cooper and others.

Finally, it has been objected that surgeons have mistaken other glands for the parotid. It may be well to notice the distinction between the question of primary disease of the parotid, and that of its removal by operation. It might be true that the gland is not subject to become primarily diseased, and yet it might require to be removed for disease extending to it. What difference, in a purely surgical point of view, can there be between a cancerous growth originating a lymphatic gland situated within the parotid and extending to this latter, causing its absorption, and the same growth originating in the parotid and extending to the lymphatic glands? Scirrhus of the female breast sometimes originates in the skin.—Velpeau *Traite des Maladies, de Sein*, p. 437.

But this in no wise changes its nature nor obviates the necessity of removing the whole gland when this has become involved. I have, in three cases of disease of the lower jaw, removed the half of it, with every vestige of both the parotid and submaxillary glands, which were perfectly involved in the diseased mass.

It will be noticed that Nelaton describes scirrhus of the parotid gland as developing itself from above downwards. McClellan pointed out that in some cases of disease of the gland it gradually raised itself out of the triangular space in which it is placed, so as to present fewer difficulties in removal than when in a healthy state. Dr. N. R. Smith speaks of its even becoming "pediculated." Pancoast attributes to Randolph the first observation of this fact.

In the first operation which I performed, the finger passed under the gland from below upwards with a facility which surprised me. The disease was a scirrhus of the gland.

While admitting the difficulty of distinguishing between cases of disease originating in the tissue of the gland and those extending to it, I am not prepared to believe that any well informed surgeon need be in error in regard to the parts actually removed by operation. I am in the habit, after all such operations, of examining the tissues with a magnifying glass, of having them examined with the microscope, and of carefully inspecting the whole surface of the wound for any suspicious tissue. I generally, and always unless some reason for a different course appears, defer closing the wound until the oozing of blood has entirely ceased. By thus carefully proceeding, mistakes can be, for the most part, avoided.

In the lecture referred to by a Professor in the Lind University, the opinion was advanced that the parotid, with the exception of enchondroma, is absolutely exempt from disease. This assertion was not called in question by any one except Dr. Paoli, who, in a recent No. of the *Louisville Journal*, has published a valuable article on the subject.

This is so gross an error that it ought to be at once detected by any medical practitioner, and in order to place the subject in its true light, I here transcribe, from my notes for lectures, authorities sufficient to leave no doubt in the mind of any person desirous of learning the truth on the subject.

Dr. J. H. Bennett relates a case of disease originally in the parotid gland, having all the appearance of malignancy. Mr. Syme advised against an operation. The patient died. Mr. Bennett found no cancer cells, and considered it cancroid. He also quotes a similar case from M. Sedillot, in which a tumor, having all the characteristics of malignancy, ulcerated and soon entirely destroyed the parotid gland, but as no cancer cells were found, Sedillot considered it cancroid. This also proved fatal.—On Cancers and Cancroid Diseases; Edinburgh, 1849, p. 83, *et. seq.*

Dr. Lebert (*Traite Practique des Maladies Cancereuses*, p. 703) says: "We have observed, for our own part, cancer of the parotid gland three times." "The development, march, termination, and treatment of cancer of the parotid, are about the same that we have indicated for cancer of the lymphatic glands." But it should be remembered here that cancer of the parotid, in its progress, involves the jaw, and in case of extirpation all parts of the bone diseased should be taken away."—Ib., p. 704.

"The tissue of the parotid sometimes becomes, though rarely, the seat of a scirrhus degeneration." "Extirpation is the only means that we can oppose to this disease." "When the whole of the parotid is to be removed, the plan which appears to us preferable is that which was proposed by M. Begin," (Roche, Sanson, and Lenoir.—*Nouvaux Elements de Pathologie Medico-Chirurgicale,* p. 115, vol. iii. Paris, 1844.)

Nelaton, in the second volume of "Pathologie Chirurgicale," p. 714, *et. seq.*, gives a very full and succinct review of the diseases of the parotid. Besides wounds and salivary fistulæ, he describes:

1. Abcesses, which among other points of origin "may be in the salivary gland itself."

2. Concretions and salivary pouches. "These concretions," he says, "are liable to obstruct the flow of saliva so that these result sometimes in a voluminous tumor, oblong, indolent, circumscribed.

3. Cysts; of which an example is quoted from the Bulletin of the Academy of Medicine, vol. 1, p. 56.

4. Hypertrophy. Of this two examples are quoted from A. Berard and Sabbatier.

5. Fibro-fatty and melanotie.

6. Sanguine tumor.

7. Cancer. There are some cases where the parotids present a cancerous degeneration. Mekel has dissected a certain number, and Berard reports some examples in his thesis already cited. When the gland itself is degenerated, we find usually a scirrhus instead of an enaplalous

tumor. This tumor remains a long time indolent, small, and of a stony hardness.

*Treatment.*—The extirpation of the tumor is the only means of relieving the patient. Neither its considerable volume nor its adhesion to subjacent parts, nor ulceration of the skin ought to be considered absolute contra-indications to the operation.

The facts which render it probable that the gland has been entirely removed, are those of Warren. Kirby, Milman, McClellan and Preiger, Raymond, Carmichael, and Gensoul. Those which prove that the gland has certainly been removed are, according to M. Berard, those of Randolph, Smith, Lisfranc, Gensoul, Beclard, Bramberg, page 73.

*Chelius.*—The removal of the parotid gland belongs to the most difficult and dangerous operations, as the close connection of the gland with the important neighboring parts render necessary the wounding of very important vessels and nerves, etc. P. 523, vol. 3.

Cases of the removal of the parotid gland are related by Preiger in Von Graffae and Walther's *Journal,* vol. 2, p. 454, and in *Rust's Magazine,* vol. 19, page 303.

Barendts, ib. vol. 13, p. 159.

Schmidt, ib. p. 312.

Weinhold, *Sulzberg Med. and Chir. Gazette,* vol. 4, p. 63 ; 1823.

Beclard, Archies Geerales de Medicine ; 1824. Vol. 4, page 62.

Chelius, Heidelberg Clinical Annals, vol. 2, p. 2.

Kirby, J., Dublin, 1825.

In the case of Dr. Preiger, the tumor weighed two pounds and three quarters, and the operation lasted seven minutes.

In summing up this testimony on the subject in 1842, Reese, in his Notes to Samuel Cooper's Surgical Dictionary, p. 259, vol. 2, said:

"The parotid, in a scirrhus state, can be entirely extirpated."

"In Dr. Preiger's, Mr. Kirby's and of McClellan's cases, the trunk of the external carotid was left untouched."

Mr. Goodlad's case is reported in the Med. Chir. Transactions, vol. 7, p. 112, and vol. 8, p. 582: "The disease extended from the external canthus of the eye above, to within three quarters of an inch of the clavicle below, and some idea of the depths of its attachments may be formed, when it is known that the whole of the parotid gland is involved in it." "*The parotid gland was entirely removed.*" Samuel Cooper's Dictionary, p. 263, vol. 1.

In vol. 2, p. 101, Transactions King's and Queen's College of Physicians, Dublin, 1818, is reported Mr. Carmichael's case, "The tumor was very large, involved the parotid gland, and connected with the transverse process of the atlas, the basis of skull, the meatus auditorius, mastoid process, and the angle of the jaw." The case was successful.

Klein operated on a woman of seventy, "The swelling extended from the ear to the shoulder." "The internal carotid artery and the par vagum were left quite bare." "The bleeding was very inconsiderable." "The operation was so successful that in the beginning of the third week the wound was healed."—Ib.

Beclard's case was for a scirrhus of the parotid alone. Samuel Cooper says the following inferences are deduced from this case: 1. "The reality of the scirrhus of the salivary glands is confirmed." 2. "The possibility of removing the parotid demonstrated."—Ib. p. 274.

This case proved fatal, and an examination was made after death, so that no dispute concerning the operation, being the entire removal of the parotid gland, could arise.

There is no surgeon who did so much to establish the operation of extirpation of the parotid gland as a legitimate one in surgical practice, as the late Dr. Geo. McClellan, of Philadelphia. Much of the acrimony which has been introduced into this discussion has no doubt arisen from that controversy in a great measure personal, and foreign to the purely scientific question, into which he was drawn by the attacks upon his character as a surgeon. These attacks, prompted by the same motives, are still occasionally made upon those who propose the operation.

Dr. McClellan says, (Principles and Practice of Surgery, p. 352,) "I have extirpated *eleven entire parotids*, in various conditions of organic disease, and only one of my patients died in consequence of the operation."

"The next case which occurred to me I turned over to my son, who successfully removed an enormous tumor, involving the whole parotid, an immense mass of lymphatic glands, extending down the neck, with the common carotid artery, the internal jugular vein, the par vagum, spinal accessary, and portio dura nerves. The patient, George Andrews, of Washington, Pa., went home in four weeks, with the wound entirely healed."

This case is worthy the attention of those who think the relations of the gland to the great vessels are such as to render an operation impracticable, even when it does not touch them.

But this appears to be the only case of operation on record in which those vessels were involved. In one of Dr. McClellan's cases the external carotid did not require a ligature. "Before he proceeded farther he isolated the continued trunk of the external carotid just as it was entering the tumor together with the descending veins, which accompanied it, and, instead of cutting them across, in the usual manner, he tore them out from the body of the tumor with the thumb and fore-finger." The vessel bled for a moment only, and ceased without a ligature.—Ib., p. 334.

In one of Dr. McClellan's cases, (Mr. Socher,) death took place from an abdominal disease, eighteen months after the operation, and the body was carefully examined. No trace of the parotid gland could be detected.—Lecture on the Parotid Gland, by G. S. Patteson, 1833, p. 13.

The case of John Bell is related in his Principles of

Surgery, New York, 1810, p. 507, *et seq.*: "The tumor, of the size of a goose's egg, was once removed with about half the gland. It returned, and Mr. John Bell removed the whole of it."

Liston (Lectures on the operations of Surgery, Philadelphia, 1846, p. 308,) says, on the subject of Diseases of the Neck: "Tumors of this region occur in different aspects and corners of it. You meet them at the upper part of the neck and at the angle of the jaws. They sometimes arise from a degeneration of the salivary glands; but that is not a common occurrence." "Sometimes they are very firmly fixed, but after all they come out easily enough."

Colles, who was one of those who, for anatomical reasons, believed the removal of the gland impossible, (was it because Charmichael had performed the operation?) says, under the head of Salivary Glands: "They are sometimes the seat of scirrhus."—Lectures on the Theory and Practice of Surgery, Philadelphia, 1845; p. 107.

Rokitansky enumerates, among the diseased conditions observed by himself in the parotid, inflammation, cysts, fibrous, cartilaginous, and osseous growths, etc.

"Carcinomatous disease occurs in the parotid and salivary glands, and especially in the parotid, in the shape of scirrhus and medullary cancer.—Path. Anat., vol. ii, page 141.

Warren gives a minute and accurate description of the tumors of this gland:

"The parotid gland is the seat of two species of induration, one in the lymphatic glands situated about it, which is quite common; the other a genuine induration of the gland itself, which is quite rare."

"The induration or scirrhus of the parotid gland begins deeply in the space between the branch of the jaw and the mastoid process. Its confined situation renders it painful at an early period. Being confined on the sides by bone, it extends outwards and downwards, assuming a conical form in all the cases which I have seen. This tumor is of a scirrhus hardness." "Ulceration does not take place in a long series of years."

"The scirrhus state of the parotid being incurable by remedies, a surgical operation is the only resource. An operation requiring some degree of skill, coolness, and a knowledge of anatomy."—On Tumors, p. 286, 287.

On the subject of these diseases, Dr. Gross says: "All the salivary glands are not equally liable to morbid alterations. The parotid is infinitely more frequently affected than the others." "Parotitis, under favorable circumstances, may terminate in suppuration. Of this I have witnessed a considerable number of cases, in two of which an opportunity was offered of making an autopsic inspection." "Gangrene has been known to seize on the parotid." "The salivary glands, especially the parotid, are subject to atrophy." "True scirrhus is occasionally met with in the parotid, as are also encephaloid and melanosis."—Path. Aut., p. 518, 519.

Baron J. D. Larry removed the parotid gland for cancerous disease, March 19, 1841. Numerous enlarged lymphatic glands were discussed by a long course of treatment when "there remained the parotid tumor of the form and size of a large hen's egg, deeply situated between the ear and the ramus of the jaw. It was soft at the centre, hard at the circumference, and slightly movable.

On the 70th day the patient was entirely recovered, the sensibility and the movements of the side of the face, which had been destroyed at first, was restored in part.

In concluding the report of this and a case of removal of the submaxillary gland, M. Larrey remarks, "From these two examples of complete success obtained by extirpation of salivary glands, (the parotid and submaxillary) we may conclude that this extirpation is practicable, and may be performed without danger to the life of the patient."—*Memoire sur L'Extirpation des Glands Salivaire,* Paris, 1841; pages 21 and 22.

From these authorities alone, (and many others might be cited,) we may safely conclude that the parotid gland is subject to disease, and that its removal in favorable cases is both possible and advisable.

# ARTICLE XIV.

## *On the Nature of Death from Chloroform.*

THE following tables are the result of a suggestion made to me by one of our most eminent hospital surgeons, my friend Mr. Paget, who, having done me the favor recently to read my little book on Chloroform, expressed a wish that I would "compare the number of deaths after small and after great operations, to see whether the proportions of their several numbers be different from that of their several chloroform mortalities." And, Mr. Paget adds, "Your records would easily decide the question, and it is important to do so." I had said, (p. 63,) which Mr. Paget doubted, that patients bear large operations under chloroform best; that operations on sphincters, and tendinous sheaths about the fingers and toes, (p. 192,) were probably to be regarded with more dread under chloroform than the largest amputation, or such a terrible operation as ovariotomy. I may say here that Professot Murphy, also, who has seen a great deal of chloroform in general as well as in obstetric practice, was also struck by the same apparent anomaly, and wrote to me to say that it would require very rigorous examination before it could be received as a general law or fact, that deaths from chloroform are more frequent from small doses, and in trivial operations, rather than where large doses of chloroform had been taken. All I can now say is, that, however it is to be explained, there is no longer any doubt on the matter whatever, as any one may convince himself from an inspection of the following tables drawn up with some care.

There have been about 125 deaths from anæsthetics in Europe up to the present date. A very large number, the only list of any such cases on the continent, is one by M. Scoutetten, an army surgeon, who gives forty deaths, but unfortunately does not specify the nature of the operation for which the anæsthetic was administered. Dr. Snow gives fifty deaths, and I have since myself made out thirty-five deaths in addition. All agree as to the vast preponderance, however, of death in male patients rather than in females; it also appears that while there have been in reality no deaths as the result of large amputations, resections, ovariotomy, &c., fully two-thirds of the deaths have been from operations on sphincters, or tendinous sheaths, strabismus, tooth-drawing, &c.

| Nature of Operations causing death. | Snow. | Kidd. |
|---|---|---|
| 17 Deaths during operations on fistulæ, hæmorrhoids, application of caustics, &c. . . . . . . . . | 13 | 4 |
| 14 Deaths in removal of toe-nail, dead finger, and such operations on phalanges, . . . . . . . . . . | 9 | 5 |
| 10 Dentists' cases of tooth-drawing, &c. . . . . . | 6 | 4 |
| 11 Deaths from removal of tumors, . . . . . . . | 7 | 4 |
| Resections, largea mputations, midwifery, ovariotomy, ligatures of large arteries, &c., . . . . . . . | — | — |
| 9 Deaths in minor amputations (but six occurring before the operation commenced,) . . . . . . . . | 4 | 5 |
| 6 Deaths in strabismus, operations on eye, &c., cysts of eyelids, &c., . . . . . . . . . . . | 2 | 4 |
| 9 Deaths in operations on testis, sounding, &c., (2 included doubtful in 218 lithotomy cases,) . . . . . . | 6 | 3 |
| 5 Deaths from reduction of dislocations, . . . . | 2 | 3 |
| 1 Death from strangulated hernia, . . . . . . . | 1 | — |
| 3 Deaths from delirium tremens, . . . . . . . | — | 3 |
| | 50 | 53 |
| Scoutetten's cases (not specified) . . . . . . . . | 40 | |

This table explains itself; the general result is very curious, and I think very convincing, that in the hundreds of thousands of operations where chloroform has now been used, it has proved in the vast majority to be perfectly safe, and that it is safer in large than in small operations. Why it is so, I may not now stop to inquire. Again, of sixteen deaths under chloroform, where I was myself able to trace out the probable cause of the fatal issue, I found three where some remote disease of the heart might be suspected; but in thirteen there had been probable, and in some very serious derangement of the nervous system—viz. three deaths from delirium tremens and chloroform combined, two where chorea and meningitis were present, two from cysts in the brain, and four from other lesions of cerebral tissue. It seems too evident, I think, that if syncope or "fit" should occur in any such case, resuscitation is rendered difficult, as we have an imperfect brain and spinal apparatus to work with. Disease of the heart is a very rare cause of death from chloroform; the facts on which this hypothesis was built up are now shown to be all erroneous.

There is a sad want of uniformity in the mode of making post-mortem examinations in our London hospitals. In two necropsis in the borough hospital, and one at the Royal Opthalmic, Moorfields, I was present, and anxious to see the state of the heart and pericardium before the latter was opened; in two I was successful, but in the third the head was opened first, and a large drainage of fluid took place from the jugular veins, sinuses, &c., which left the heart flaccid. Even in one of the other cases, where in good routine fashion the hospital porter opened roughly all the three cavities at once, and left them all open for an hour, awaiting some "crowner's quest," or magisterial inquisition, it was not less difficult to come to any steady or useful decision on the case. I observed, however, while awaiting this hour, that the right cavities of the heart were very much distended with fluid blood; the pericardial contents and pericardium bulging very prominently, "filled to bursting almost," till the examination of the lungs commenced, when the section of the large vessels of course emptied the heart; the heart being then examined was marked "perfectly healthy—and empty." It seems to be not a bad mode of proceeding to open all the cavities together, but our great want in the hospitals is some uniformity; and in a very painful degree some uniformity in the examination of dead bodies after accidents from chloroform. Some other remarkable facts have been discovered during the course of these investigations, as to death from chloroform, which it is of interest to note. First, that a very large number of the twenty-five deaths from the use of anæsthetics after operations have been deaths from the effects of the slow administration of ether, or ether and chloroform mixed, but not from pure chloroform. I published nineteen deaths from ether two years ago, yet it is still suggested in America, that there have been no deaths from this agent. Scoutetten gives five; and since then there have been at least four or five more from ether or amylene; so that on the whole, there appears at present about a hundred deaths from pure chloroform, and one-fourth (or twenty-five) from ether or amylene! Next, as to the stage or degree of the anæsthetic process which appears most dangerous, this (contradictory though it seems) is decidedly the stage of excitement, or the early stage of violent plunging, before the patient is rendered anæsthetic and fit for the operation he is about to undergo. This escaped the knowledge of Dr. Snow.

| | Snow. | Scoutetten. | Kidd. | Total. |
|---|---|---|---|---|
| In 121 deaths the relative dangers of the chloroform "Stages" were: | | | | |
| Deaths when chloroform was given for intended operations, or immediately before operations, | 18 | 22 | 14 | 54 |
| Deaths during the progress of operations, | 22 | 6 | 14 | 42 |
| Deaths after operations—*i. e.* from chloroform immediately after, or the result of chloroform and the operation combined a short time after the operation had been completed, | 6 | 12 | 7 | 25 |
| In 133 deaths the relative frequency of deaths as to sex was: | | | | |
| Males, | 30 | 32 | 28 | 90 |
| Females, | 20 | 16 | 7 | 43 |

I will only say in conclusion, that I look on this suggestion of Mr. Paget as very valuable, and these results as most unexpected. I am, &c.,

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P. S.—I think it will be found that the mode of death by "fits," trachelismus, syncope, &c., observed before operations occurring suddenly, and consequently the means to be adopted for resuscitating patients in such accidents, differ very widely from the mode of death observed and means to be adopted for resuscitation of patients who show a tendency to sink after operations (by asphyxia?) We have hitherto confounded the two, and have been looking for some one great secret cause of these most melancholy occurrences. One set of accidents seem to occur suddenly from chloroform; the other slowly, but from ether. It appears also very instructive and consoling that in all the large tedious operations,—such as resections, large amputations, midwifery, ovariotomy, ligatures of large arteries, &c.—such is the "law of tolerance" of chloroform, that in these formidable operations it is almost free from danger; whereas, in trivial operations, (where, fortunately, we might use Dr. Arnott's congelation plan) the chances of accident are very serious indeed.

*British Jour. of Dent. Science.*

## ARTICLE XV.

### *Death from Chloroform.*

ANOTHER death from chloroform is reported in the *Cincinnati Lancet and Observer*, by Dr. KRAUSE, of Cincinnati. It occurred during an operation for iridectomy. The following is an abstract of the case in Dr. K's own words:

"On the 25th of last month I performed an operation for artificial pupil, on a farmer, 29 years of age, who had generally enjoyed good health. About a year ago he suffered from protracted intermittent fever. The disease of his eyes dated from this time. His constitution was scrofulous anæmic. Preparatory to the operation chloroform was administered on a folded cloth, by an assistant sufficiently expert in its use. The patient, who had been enjoined to keep his stomach empty on the morning of the operation, inhaled the chloroform in the recumbent posture, from 11 to about 11½ o'clock. He took one and a half ounces of it without resistance; nor did he even manifest the usual ecstatic symptoms. I finally proceeded with the operation, after having three or four times desisted from it on account of the patient's restlessness whenever the lid-holders were applied. Previously, however, the removal of the chloroform was ordered from the patient's mouth and nose, as his breathing had begun to be stertorous. The operation, iridectomy, lasted about five minutes. The anterior chamber of the eye partly filled with blood, which I was about to let out, when I noticed a sudden paleness of the anterior ciliary vessels, which had become injected under the touch of the instruments. Then I found that the patient had ceased to respire, while the action of his heart, though weak, was still perceptible to the ear, regular, and about sixty beats in a minute. Ice-water, sprinkled into the patient's face, on his chest and epigastrium, had no effect. Rhythmical depression of the abdomen also failed to restore respiration. I therefore resorted to Marshall Hall's method. Windows and doors were opened, the patient's mouth and throat cleaned from a very tenacious mucus, which was not prone to discharge by its own gravity, and peripherical circulation promoted by rubbing of the extremities heartward, the occasional use of ice-water and clapping of the skin. The function of the heart was sustained by these means nearly an hour. Respiration, however, which had occurred at first about once every minute a few times, gradually lessening the patient's livid complexion, became less frequent and more superficial, until it degenerated into mere pseudo-pnoic efforts. There was during the agony a twitching of the muscles about the mouth, and a drawing up of the patient's legs: then pulsation also stopped. We ceased our efforts at resuscitation one hour and a quarter after the first symptoms of apnœa had appeared.

"No post mortem examination was made. The deceased had never complained of anything indicating disease of his thoracic organs. His size was over six feet, the configuration of his chest normal. During my short acquaintance with him his spirits were depressed, his temper torpid."

There is no comment necessary. So rapidly are the cases accumulating, showing the often unavoidable fatality of chloroform, that hereafter the administration of chloroform, except in cases where ether has absolutely failed, must be considered as a sign of recklessness or ignorance.

*Med. and Surgical Reporter.*

## ARTICLE XVI.

### *Influence of the Sun's Rays in the Production of Organic Matter.* By Chas. T. Jackson, M. D.

Plants alone possess the property of converting inorganic and mineral elements into organic substances, a power wholly denied to animals. They are enabled to effect this wonderful conversion through the influence of the solar rays, and chiefly by the decomposition of carbonic acid gas, the carbon being separated and combined with other elements, while the oxygen is given off and goes to form that portion of the atmosphere essential to the respiration of all animals. So rapid is the operation of the foliage of plants in abstracting carbon from carbonic acid of the air, that if we place a green and leafy bough of a tree in a glass globe, and place it in the sunshine, and then blow air through the globe, by means of a pair of bellows, the air, after passing over the foliage, will be found deprived of all its carbonic acid, and oxygen will have taken its place.—(Dumas.)

When we draw a breath of air into our lungs, and then exhale it, though it has been but a moment in the lungs, it will be found so charged with carbonic acid gas, as to extinguish a burning candle. This experiment is easily made by fixing a glass tube, inserted through a cork, into the top of a glass bell or receiver, open at the lower part, and placed in a vessel of water, and drawing the air from the receiver into the lungs, so that the water will rise and fill the vessel, and then breathing back the air into the receiver. Now if the cork is removed, and a lighted candle is lowered into the bell, it will be immediately extinguished. To show that foliage, in sunlight, will restore the respirable properties of the air, bend a leafy bough so that it shall pass under the edge of the bell and come in contact with the vitiated air, and expose the whole for a few minutes to sunlight. The carbonic acid will be decomposed, and the carbon being removed, oxygen will be left in the bell, and the candle being again applied will burn freely.

Water is not decomposed by the respiration of fishes, but only the air, dissolved in the water, goes to support their respiration, the proportion of air dissolved in water being, on the average, about 2½ per cent. of its bulk.

Aquatic plants depend upon the small quantity of carbonic acid that is dissolved in water for the production of their carbonaceous tissues and juices, and they, like other plants, decompose carbonic acid through the influence of the solar rays, and give out oxygen. Thus plants and fishes aid each other, the one producing the proper respirable food for the other. Without aquatic plants, water would soon be unable to sustain the respiration of fishes; and hence in natural lakes and rivers, aquatic vegetation maintains the water in its proper condition for the respiration of these animals. So in well-balanced aquaria, the proper proportions of animal and vegetable life may be kept up, and, provided there is sufficient sun-light, no mechanical admixture of air is needed; for the plants will re-produce the oxygen from the carbonic acid exhaled from the fishes' gills.

The atmosphere is an ocean of mingled gases, chiefly nitrogen and oxygen, with a small proportion of carbonic acid, the proportions being, nitrogen 76·9, oxygen 23 per cent. by weight, while that of carbonic acid varies from three to sixteen thousandths parts. Aqueous vapor in variable proportions, is also dissolved in the air, the quantity depending on the temperature. Owing to the law of diffusion of gases, there is no separation of the heavier from the lighter by gravitation, and Gay Lussac found carbonic acid in the air he brought down in his balloon from a height of more than five miles, while Saussure ascertained its existence uniformly in the air over the highest peaks of the Alps. In large cities there is an accumulation of carbonic acid, owing to the want of free circulation of air; and the absence of an adequate amount of foliage for its removal; but it rarely accumulates in sufficient quantities to materially affect animal life. We live, then, at the bottom of a great atmospheric ocean, more than fifty miles deep.

The sun's rays penetrate readily through this atmosphere, and affect plants and animals on the earth's surface. From the dawn of creation—from the time when "God said let there be light, and there was light"—for myriads of ages, has the glorious orb of day been engaged in performing his beneficent work, and long before the creation of man the solar rays were busily employed in the preparation of the world for his advent.

Solar heat, absorbed by the wide-spreading ocean, at a time when scattered islands existed in the place of our present continents, warmed the waters, which so retained the heat as to give an almost tropical character to vegetation, even in climes far removed from the equator; and the small area of land above the surface of the ocean radiated away into space but a small proportion of heat.—Hence, perhaps, the much wider extension of the tropical flora in ancient times, when the great coal formations were produced, and the remains of tropical animals in regions too far removed from the equator to allow of their existence in those regions now.

Some geologists think that the equalization of temperature, by circulating warm water, is adequate to account even for the fossil flora and fauna of Melville's Island and of the Siberian Coast, and also of the Arctic regions of America. Brogniart supposes that there was originally a larger proportion of carbonic acid in the air than now exists, and that under those favorable conditions of greater warmth and a humid climate of the oceanic islands, a rank vegetation grew and rapidly abstracted carbon from this gas, and converted it into those plants of which coal was formed.

By this operation ages of sunshine became converted into fossilized light and heat; for submerged plants were changed into bituminous coals, which at present supply us with light and heat, both of which, in the form of coal, were stored up long anterior to the creation of man.

This wonderful provision of coal, the source of most of the light and heat we enjoy in our dwellings—this accumulated and almost incalculable source of power concentrated in the bowels of the earth, was prepared by that being who created man, long before his coming, and thus the world was in the earliest stages fitted for the labors of civilized life, and the arts were provided with their most indispensable first materials, and the source of their greatest power.—*Boston Medical & Surgical Journal.*

# ARTICLE XVII.

## *Acupressure for the Arrest of Hemorrhage.*

At a late meeting (April 24th, 1860,) of the Royal Medical and Chirurg. Society, Mr. Syme, of Edinburg, in reply to a question by Mr. Henry Thompson, said that acupressure was not, in his opinion, calculated to improve the practice of surgery. In the first place, he did not think the objections alleged against the ligature were fully justified; in the second place, if the ligatures were objectionable, they had a better substitute for it in torsion than in the needle process; thirdly, he thought the needle process was hardly practicable, and in some cases not practicable at all. It had been said by the proposer of the method that the ligature would occasion gangrene. That simply showed that the individual who proposed it did not know the meaning of surgical language. As to ligature causing irritation, that assertion was not true. He had repeatedly tied the femoral, and left the wound to heal by first intention, there being only a few drops of matter, and in one case not a drop, showing that the ligature was not the cause of irritation. He had given up the practice of cutting away one thread, always preserved both; and he regarded ligatures rather as useful assistants than as obstacles. After amputation, the great impediment to union by the first intention was the presence of blood, which coagulated, and led to the formation of abscess. The ligatures prevented this, made way for the discharge, and did good rather than harm. But if ligatures were sometimes objectionable, the process of torsion was a convenient substitute, the success of which he had repeatedly seen. As to the acupressure, it could very rarely be employed; and his only surprise was that any practical surgeon should have given it two thoughts. It was a tub thrown out to amuse the whale, more especially to feed the whale, and would never have been heard of had it not been brought under the notice of the profession by a medical journal published in London, understood to be under the control of the proposer.

Mr. Spencer Wells said he should not notice the personalities with which Mr. Syme concluded his speech; but with regard to acupressure he thought it but just to say that he had employed that method in a case of Pirogoff's amputation at the ankle-joint, in which the needle was fairly pitted against the ligature. The anterior tibial artery was compressed by the needle, and a plantar branch of the posterior tibial was tied by a ligature. The superiority of the needle was most marked. In forty-eight hours Mr. Adams, whose case it was, removed the needle, and there was no more trouble about it. The ligature remained some five or six days afterwards, setting up suppuration in its track, and keeping open the wound in the manner which Mr. Syme appeared to think so favorable (the patient thought otherwise,) but which certainly delayed the cure. The case would have been better treated if it had been easy to compress the posterior tibial artery in the same manner as the anterior tibial, if he had not to learn the A B C of acupressure, as all must do. There might be many cases in which the needle is not applicable; but he believed if he had known then what he had learned since, he might have been able to compress the plantar artery as easily as the other. So far from the introduction of acupressure exhibiting any want of surgical knowledge on the part of the gentlemen who proposed it, he believed it to be one of the many gifts, including the introduction of chloroform, for which surgery is indebted to that great man. Mr. Wells further expressed his conviction that acupressure will prove a most useful means of suppressing hemorrhage, and he had learned its utility in compressing varicose veins. He believed, also, that it will hereafter supersede the ligature in the treatment of aneurism. With regard to the effect of the ligature upon the ends of divided arteries, every surgeon knew that the part of the artery beyond the ligature must be killed by it, and that a piece of sloughy tissue cannot do any good when confined amid the living tissues of the body, however useful Mr. Syme might consider it to be.

*Med. Times and Gazette, May* 5, 1860.

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## ARTICLE XVIII.

*On the Manna of the Hebrews.* BY M. O'RORKE.

ALL commentators upon the Scriptures have, until now, regarded the substance upon which the Israelites were nourished in the wilderness for forty years, as a true manna. From the recent investigations of Dr. O'Rorke it becomes evident that this manna was a kind of lichen, and, very probably, analogous to a species which he has shown in Paris, which was derived from Algeria.

The following is an abstract of Dr. O'Rorke's communication :—We read in the 16th chapter of the Book of Exodus, that "The Israelites took their journey from Elim, and came into the wilderness of Sin. God came to the succor of his people. At even the quails came up and covered the camp; and in the morning a thick dew lay round about. It was a kind of white grain suitable for making bread: It had the taste of the purest flour mixed with milk. When the children of Israel saw it, they said one to another *Manhu!* What is this?" From this exclamation arose the word manna. "It covered the camp at the dawn of day, and melted at the first rays of the sun. This manna, when pounded, could be formed into a paste, and baked as bread, or made up in several ways in pastry."

The Israelites speedily took a dislike to this food, for a little further on (Numbers, chap. xi., v. 6-8) we read again: "But now our soul is dried away, there is nothing at all besides this manna before our eyes, and the manna was as coriander seed, and the color thereof as the color of bdellium." The people went about in quest of it, and having gathered it they ground it in mills, or beat it in a mortar, and baked it in pans, and made cakes of it, which had the taste of unleavened bread kneaded with oil. Dr. O'Rorke has remarked that the various translators of the Hebrew text differ amongst themselves as to the taste of the manna. One version of the 31st verse of the 16th chapter of Exodus is thus rendered: This manna was like coriander seed, it was white, and it had a taste resembling the purest flour mixed with honey. The translators have evidently confounded the expression sweet, little sapid, insipid, and sugary, since they refer the flavor of manna to that of milk, of honey, and even of oil. Now, in all the European languages the word manna is employed to designate a kind of sugary gum,—a concrete sap, which exudes from certain trees in Sicily, Calabria, and Spain, either spontaneously, or by the puncture of insects, or by artificial incisions. The officinal manna is obtained from a species of ash (*fraxinus ornus* and *rotundifolia*,) and is collected in June and July. The Sicilian manna is purgative, and it is clear that this manna is not that of the Hebrews. But there are many other kinds of manna known; it is certain even, that this name has been extended to some sugary or resinous substances, and to true honeys. In Europe the larch (*larix europœa*) yields a concrete juice called manna of Briançon or manna of the larch. The juniper also, and in Sweden the *pinus picea* yield some at the extremities of their highest branches. The East also furnishes several kinds of manna derived from different plants, in Syria, Persia and Arabia. These are obtained from the cedar, from a leguminous plant (*hedysarum alhagi*,) from the oriental oak, (?) from the tamarisk, and from several other undetermined species of plants.

All these mannas are collected upon the branches and the leaves of the trees which produce them, or upon the ground beneath the same trees. They assume the form of little seeds like to coriander, sometimes as white as snow, which the inhabitants collect in June and August before the sun rises; for when the sun has risen, these little masses melt, and form a honey-colored coating which does not separate spontaneously from the branches. Rauwolf, Gmelin, Niebuhr, and especially Burckardt, have given very correct descriptions of these mannas, and of the plants which produce them.

Burckardt, in the account of his travels in the deserts of Sinai, which were traversed by the Israelites, mentions the tarfa or tamarisk as being the plant which furnishes the manna of the Hebrews. It is really strange, says he, that this should have remained unknown in Europe until it was indicated by M. Seetzen. This substance is called mann by the Arabs, and resembles, up to a certain point, the description of manna given in the Scriptures. It may be remarked further, that this manna is only found in very wet seasons; sometimes it is altogether wanting. In the season during which the Arabs collect it, it never acquires that degree of firmness which will allow of its pulverization. The amount of tamarisk manna really collected, even in the most favorable seasons, is insignificant, and does not exceed five hundred livres for the whole of the country. It is entirely consumed by the Bedouins, who regard it as the most delicate dainty which the country furnishes. The cedars of Lebanon also yield a manna which resembles that of the larch, called cedrine, mastichina; in Egypt, the *asclepias procera* also produces a farinaceous manna, and in Syria the *apocynum syriacum* is in the same estimation. But all these mannas, and especially that of the tamarisk, differ very much from the manna of the Israelites. The manna of the Hebrews fell from heaven, and covered the camp on the ground; whilst the real oriental mannas are obtained from the stems, branches, or leaves of the trees from which they exude, and cannot be dispersed into the atmosphere and then fall in the form of dew. It is true that, anciently, all the mannas were designated by the expressions of dew of heaven, honey of the air, heavenly honey, because the ancients imagined that the sugary drops suspended from the trees were produced by the dew which hardened upon those plants. Such was the opinion of Aristotle, Pliny, and Avicenna. Mathiolus regarded it as a sort of saliva or excrement from certain stars; and it was not till 1843 that all these absurd beliefs were shown to be wrong by Angus Palea, who demonstrated that Sicilian manna did not fall from heaven in the form of dew; he proved that it was produced directly from the proper juice of the ash, by simply covering such trees with a white cloth, and thus isolating them from external influences. Moreover, the supply of Eastern manna often fails for one or more years in succession; it is always anything but abundant, the trees only producing it for two or three months in the year. The manna of the Bible, on the contrary, fell all the year, and continued to do so for the long period of forty years, without intermission. The real manna is only employed as a condiment or dainty—that of the Hebrews served for their daily bread. Moreover, until now, no travelers have related that the Arabs really use manna to replace their bread during meals.

The manna of the Hebrews was not, then, a true manna, and Dr. O'Rorke believes that he can demonstrate evidently that this manna was a *lichen*. The lichens are cryptogamous, and there are a great many species. They are the first plants which make their appearance upon naked bodies, such as stones, rocks and the ground. These plants have no true roots, and are not parasitic, except in appearance, for they do not live at the expense of the body upon which they are applied and to which they adhere. Heat dries them up, but moisture restores them to life. No lichen is deleterious, and all contain a nitrogenous matter, and in abundance a kind of starch; they are employed, therefore, in several parts of the globe as food for man and other animals. We could even employ them everywhere for such a purpose, did we not possess more nourishing matters, and of more agreeable flavor. In Lapland the reindeer eat them; in Norway, those of the inhabitants which are nourished by them are said to be less frequently affected by leprosy than those of whom fish constitutes the principal food. The alimentary value of certain lichens would be even superior, according to some authors, to that of wheat, since a bushel of powdered lichen is equivalent to two bushels of wheat-flour. A great many lichens contain enormous quantities of oxalate of lime. Some contain a bitter principle (*cetrarine*, &c.,) which renders them febrifugal; others a rich coloring principle (*orcine*:) and all contain a fecula analogous to inuline, which is not colored blue by iodine.

Amongst the lichens, there is one which is called by Pallas, lichen esculentus, and which, according to Acharius, belongs to the genera lecanora and (?) parmelia. This lichen is found in Persia, in the deserts of Tartary, in the Crimea, in Asia Minor, &c., always on the ground, where it is carried either by the winds or by its falling from the neighboring mountains. It there sometimes forms beds several inches in thickness. The sheep are nourished by it, and men make of it a kind of bread, which the poor consume and regard as true manna sent to them by Providence. Already, on the 3d of August, 1828, Thénard had presented to the Academy of Sciences a lichen of a fawn color, granulated, composed of broken crusts, which had fallen in the neighborhood of Mount Ararat, in Armenia, and which a Russian general of the Persian army had sent to him.

It appears that this lichen dries up during the summer upon the mountains, and is transported by the winds to a great distance, which has caused the inhabitants to say that this grain fell from heaven. This shower was not rare, and under certain circumstances covered the ground to a depth of five or six inches in several places. The sheep were very fond of it, and men were habitually nourished by it. A shower of this kind was noticed in 1845 in the Crimea, at Jenis-Bechir. It covered the ground to a depth of three or four inches, and the inhabitants, following the example of Dr. Leveillé, nourished themselves with it for several days. This lichen is even more common in the Algerian Sahara, and in Arabia. Everywhere they employ it for the nourishment of men and horses. The specimen lately shown in Paris by Dr. O'Rorke was collected by M. Bellesterot at Boghar, in Algeria, and M. Hardy, Director of the Botanic Gardens of Algiers in 1849, had sent a specimen of it to the Exposition, which was altogether unnoticed. This lichen called *takaout* in Arabia, and *ousseh elard* (excrement of the earth) in Algeria, is found in the form of little twisted rounded grains, the largest of the size of a pea, and of a yellowish-grey earthy color. Its fractured surface is white and farinaceous, and contains some particles of sand which crack under the teeth. In flavor it is insipid, amylaceous, and with a feeble aroma of the champignon. When boiled in water this lichen slightly swells, becomes more tender, and can be mixed with milk, butter and salt, and form a food which has no bad quality or disagreeable appearance.

In the Algerian Sahara, as well as in Arabia, this lichen does not adhere to any foreign body; it appears to spring spontaneously from the ground after rain; the wind collects it together in certain places in large heaps, and they say of it *acquirit vires eundo*, for in its wandering course it vegetates and increases in size. Its surface is covered with small, very apparent fructifications, from which, at maturity, the reproductive sporidia escape, which, microscopic in appearance, become dispersed over the ground, or are transported by the winds to enormous distances, in order to develop themselves, when the conditions of soil and humidity are favorable to them. Such, while it remains, is of an inestimable value to the wandering and migratory tribes of the deserts, who are preserved by it from hunger in years of famine and in certain particularly crtical circumstances.

Is it not evident, says Dr. O'Rorke, that this substance is the true manna of the Hebrews,—that which fed them with regularity for forty years in the wilderness? Those who desire a more complete agreement with the text of the Scriptures can yet admit this conclusion:—Moses has confounded under the name of manna, two distinct substances, because they both resemble each other in apparently falling from heaven, that is, 1st. An amylaceous substance which could be preserved and pulverized, suitable for making bread, might be collected at any time, increasing on the ground, like to coriander or bdellium in color; this is the lichen described above. 2nd. A sugary substance, very readily alterable, somewhat clear, and collected on certain trees or shrubs during three months of the year only, and serving as a condiment or dainty to mix with the lichen bread: that is to say, the manna of the tamarisk, of the Alhagi, and perhaps of some others. We see, then, that the real bread of the Hebrews, the manna of the wilderness, is no other than the *lichen esculentus* of Pallas, or the *lecanora esculenta* of Acharius. No commentator has hitherto alluded to this.—*Jour de Phar. et de Chimie,* and *Pharmaceutical Journal.*

## ARTICLE XIX.

*Milk Secreted by Tumors in the Axillæ.* By JURIAH HARRISS, M. D., Professor of Physiology in the Savannah Medical College.

THIS case, so far as my reading extends, presents unusual and interesting features, and is in some respects unique. I will first present the case, and follow its report by remarks and explanations of the anomalous features, as seem to me most rational and physiological.

The patient came under the observation of my friend, Dr. J. Clay Habersham, of this city. During the spring, Dr. H. handed me a four ounce vial containing a rich yellowish white fluid so much resembling human milk that I at once supposed it must be such, though I had not learned from whence it came. The Dr. requested me to make a microscopical examination, but time did not then permit, and I handed it to my colleague, Prof. Pratt, for analysis. I, however, subsequently made an examination, and found abundant milk and a few colostrum corpuscles.

The following is a history of the case:

A negro woman, Amy, aged about 38 years, well formed, stout and healthy, and of healthy family—mother of eight children, five of whom are now living. She has been perfectly healthy both as a girl and a married woman. When she gave birth to the third child, she experienced great pain in and about the right shoulder and numbness of hand. This pain was supposed by the attending physician to be of rheumatic character. She was accordingly treated for this affection, blistered, &c.

Soon after commencing to nurse the third child, she noticed small tumors, about the size of pigeons' eggs, in each axilla. She does not recollect to what size they grew, during that period of lactation, nor is she sure that there was any increase in volume after lactation had commenced. She is positive, however, that the tumors did not diminish after she weaned the third child, and the milk ceased to flow from the mammæ. During the pregnancy with fourth child, the tumors were not further developed, but after the birth of the fourth child, and at period of commencing lactation, there was an increased development of the tumors, attended with the same sensation of distension and hardness that she experienced in the mammæ. She thinks, but is not certain, that it was after the birth of the fifth child that she drew the attention of Dr. Habersham, (father of Dr. J. Clay Habersham,) to these "swellings." He deemed it necessary to tap both of these tumors, and as was recently obtained ; about one pint from the right did so, drawing off about the same quantity of similar fluid tumor, and much less from the left.

The tumors did not again enlarge, until the birth of the sixth child. Again she experienced the same sensations in the tumors as in the mammæ, just previous to the secretion of the milk, when they became larger ; and when milk appeared in the mammary glands, the tumors were soft but more distended than after birth of last child—they were not tapped during this lactation. They remained the same size during this period, and did not subside after the child was weaned. They enlarged at each period of commencing lactation, or were at least more distended and inconvenient. This spring, and during the nursing of the eighth child, Dr. J. C. Habersham's attention was drawn to the tumors. He found the right tumor the larger and more fluctuating one. He at once tapped it and gave me the fluid to examine. He drew about a pint, all that the sac contained. About a week after, I rode with him to the rice plantation, a few miles from town, in order to examine the tumors. I found the tumor in right axilla, the one emptied by trochar, very flaccid loose tegumentary structure, having grown of elliptical form, with no contents. The surfaces flattened were those pressed on by the arm and the chest. At the base of the tumor and in the axilla, could be felt a lobulated and hardened structure. Indeed the tumor resembled in appearance and to the touch, a flaccid mamma which had ceased to secrete milk, with the exception that there was not even a rudimentary nipple existing.

The tumor in the left axilla was smaller and could not contain as much fluid as that of the right. It was, however, about the size of a large orange, no appearance of a nipple ; fluctuation very apparent by percussion. I punctured it with a trochar, and drew off about an ounce of the milky fluid, but this did not empty the tumor entirely, as upon the outer side could still be felt fluctuation. The side tapped became like the tumor of the right side, flaccid, but the other portion contained evidently a fluid. This would prove that the tumor of the left was multilocular, while that of the right was unilocular. But one of the sacs of the left was emptied. Dr. H. informs me that both tumors are still in the same condition, though three months have passed, and the mother nursing the child. There has been no accumulation of fluid since.

The child was fourteen months of age at the time the tumors were last punctured. The woman states that between the periods of tapping, from fourth to eighth child the tumors were less distended after than during lactation, but never became flaccid, as when tapped.

The point of greatest interest in this case, is how did the milky fluid, possessing the physical and chemical characteristics of milk, find its way into the sacs of the axillæ.

I have diligently searched numerous works and find no reference to such a state of things, and no parallel case recorded. I have looked through works, not a few, upon physiology, and pathological anatomy, but have seen no reference to a similar anomalous arrangement. Cruveilhier, a large and beautifully illustrated work, contains nothing connected with this subject.

But three hypotheses suggest themselves to my mind in explanation of this anomaly. 1st. That the milk secreted by the mammary glands has been absorbed and conveyed to the axillæ by blood vessels, or absorbents proper, or a communication of lacteal ducts extending from mammary to axillary glands. 2d. That the fluid was secreted by the lymphatic glands of this locality. 3d. That there was in each axilla a morphological *nisus*, developing a mammary glandular tissue, which secreted the milky fluid.

The first supposition that the milk has been absorbed and conveyed from mammæ to axillæ, is utterly untenable, inasmuch as it is physically impossible for milk corpuscles, and more especially for colostrum corpuscles to pass through the pores of blood vessels, or lymphatics, and it has never been proven that the latter vessels have open mouths, as was formerly contended that the lacteals had. There is here then a denial of such a possibility from the physical structure of the absorbent tissue.

The second supposition is equally untenable, that the lymphatic glands of the axillæ took on the office of secreting milk. This view is in contradiction to the physiological laws now accepted, as applying to secretions. The secreting property of each gland or membrane, exists in the epithelial cells lining the ducts of glands or the surface of membranes, which possess the vital property of selecting elements from the blood, which form the fluid peculiar to each gland or secreting membrane. I know of no author who denies the property of such cells, as a universal law, save Dr. Draper. He, strange to say, admits the law as generally applicable to secreting tissues, but makes the liver an exception to the law. That is, that all other secreting tissues have cells peculiar to themselves, possessing the property of separating certain elements, which when combined form certain secretions belonging to certain secreting tissues. I will not, as it is too great a digression, discuss this chemico-physiological view of the subject. Suffice it to say, that Dr. Draper has given no satisfactory explanation of this exceptional violation of the general, and as I believe, universal law of the organism. That some secreting tissues do partially take on, under certain pathological conditions, the office of other tissues, is unquestioned and no longer denied by authorities. But there is no clear proof that there is an *entire* substitution of the office of one gland for the other. The nearest approach to a substitutive action of one gland for another is one (the chemical analysis of the fluid secreted by the kidneys,) may be found in the first volume of the *Sav. Journal of Medicine*, accompanied by editorial remarks. In that case the fluid was drawn from the bladder with the catheter, by the attending physician, so that no deception could have been practiced. In the editorial remarks in connection with that case, I repudiate the idea that one gland can secrete a fluid in its physiological or pathological state, with normal elements and normal proportions of the component parts which form the secretion of another glandular structure. I there made use of the following language: "That one secreting gland can take on the normal function of another in *every respect*, we are loth to admit, believing as we do that each gland has secreting cells peculiar to itself, possessing distinct and peculiar properties." "But it is well proven that some glands do take on a substitutive action for another to a considerable extent."

The third is the explanation I believe most plausible, viz. that in this instance there existed in the axillæ, a morphological *nisus*, as there always is at the situation of the mammary glands. That the morphological change, or the development of mammary secreting tissue was simultaneous in mammæ proper and in the axillæ—the latter to a much less extent. In this event, the tumors of axillæ are but *supplementary mammary glands*, somewhat rudimentary in form. The history of the case, the gradual and stated periods of enlargement, and the sensations accompanying the enlargement, being not only identical in character, but existing simultaneously with those in mammæ when milk is first secreted, are proofs, aside from the peculiar form of sacs and lobulated masses at the base of the tumors, that there was a development of mammary glandular structure. The axillary tumors were, so far as appearances and palpation could serve as guides, entirely separate and distinct—there seemed to be no connection whatever. But why should the tumors not have been developed and milk secreted during the first and second lactation, as the subsequent history of the case proves did occur, from the third to the eighth lactation inclusive? The amount and imperfect development of the mammary tissue in axillæ was doubtless small in amount, and rudimentary in character, thus requiring several impregnations and lactations to stimulate its growth and secreting powers. It should be remembered that the tumors, about the size of pigeons eggs, were first noticed during the third pregnancy, and were largely developed at the third lactation, accompanied by a feeling of fullness and pain, identical in character to that felt in the mammæ at the commencement of the third and succeeding lactations. No growth nor peculiar sensations, were felt save at the time of enlargement and distention of mammæ at commencement of lactation.

My colleague, Prof. Arnold, states that he witnessed in a servant girl, now living, three mammary glands. In this case there seemed to be a division of one of the glands, which formed the third, each of the three have nipples.

Dr. Juriah Harriss—

*Dear Sir:*—In accordance with your request, I have examined the contents of the tumor lanced by Dr. J. C. Habersham on the 16th inst., and herewith send a minute description of the same.

The fluid when first examined, had an acid reaction and seemed to be in a semi-coagulated condition, a slight creamy layer floated on the yellowish milky fluid below. I could detect *no sedimentarg deposit.*

Under the microscope, I at once recognized the *fat globules of milk,* and scattered through the field of view, appeared the very characteristic *colostrum corpuscles,* conglomerates of fine fatty molecules aggregated together by means of a hyaline substance scarcely perceptible. The appearance of the field was remarkably similar to the figure given by Funke in his Atlas.* The fatty globules ran together action of acetic acid, dissolving the albuminous envelop.

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* Atlas of Physiological Chemistry, by Dr. Otto Funke, Cavendish Society Publications, London.

Although specially looked for, *pus corpuscles could not be found.*

By chemical examination, *the entire absence of pus* was confirmed, and the presence of all the constituents of colostrum and milk ascertained. On account of the semi-coagulated condition of the fluid, caused by its acidity, I cannot say positively whether the nitrogenous matter present was albumen or casein, though from the deportment of the fluid during evaporation, I suspect the presence of both.

I append, for convenience of reference, a comparative table of the composition in 1000 parts of 1st, Colostrum. 2d, Average of normal milk. 3d, Contents of axillary tumor.

| | Colostrum. | | Milk. | | Tumor. | |
|---|---|---|---|---|---|---|
| Water, | | 828.00 | | 891.00 | | 878.80 |
| Albuminous matter, | 40.00 | | (Casein) 33.70 | | 35.02 | |
| Fatty matter, (butter,) | 50.00 | | 37.10 | | 39.08 | |
| Sugar of milk, | 70.00 | | 38.50 | | 43.50 | |
| Salts, | 3.10 | 172.00 | 1.89 | 109.00 | 3.60 | 121.20 |

The specific gravity of the milk was 1025.

It will be observed that in composition the tumor stands intermediate between colostrum and normal milk, with the single exception of the quantity of salt.

Very respectfully, yours,
N. A. PRATT,
[*Sav. Jour. of Med.*

# ARTICLE XX.

## *On a Case of Fracture of the Superior Maxilla and its Treatment.* By JAMES SALTER, M. B., F. L. S., Surgeon Dentist to Guy's Hospital.

THE fracture of the jaw had occurred immediately behind the canine tooth, apparently passing vertically up to about the summit of the fangs of the pre-molars, and then extending at right angles horizontally backwards nearly, if not quite, to the posterior extremity of the bone. The anterior portion of the fractured bone was driven inwards upon the roof of the mouth to the extent of about the third of an inch; while the second molar tooth, implanted in the posterior portion, remained unmoved, the broken bone being, as it were, a radius, of which the second molar tooth was the fixed axis. The projection of bone into the roof of the mouth led to a corresponding depression on the outer side of the jaw, and this was somewhat apparent also on the face. Very little swelling had occurred, nor was much pain felt, except on manipulation. There was, however, considerable inconvenience experienced from the fact that the displaced teeth no longer opposed their fellows in the lower jaw by a normal "bite;" the cusps of the teeth, instead of interlocking with their inferior opponents, met them more or less on the points, and the mouth could not be satisfactorily closed.

On endeavoring to force the displaced bone into its proper situation, considerable pain was produced; it could not be got thoroughly into position, and when the pressure was removed the bone almost immediately resumed its former direction—projecting inwards. During this manipulation distinct crepitus could be felt.

To meet what appeared to me the requirements of this case, I adopted the following plan of treatment:—I prepared a gold plate to fit the interior of the mouth, so as to hold the displaced portion of bone as much as possible in position, thus far acting in every sense as a splint, but with the additional advantage that it was capable of repeated alterations from time to time so as still further to force outwards the inward projecting bone and teeth, as the patient could bear the pressure. I first took an accurate model of the mouth, and upon this the plate or splint, whichever it may be called, was constructed, embracing two of the firm teeth on the left side—namely, the first molar and second bicuspid; then, passing over the palate behind the incisors and canines, it was made to bear on the right side against the displaced teeth and bone, extending still further backwards and surrounding by a wire the second molar tooth, which had not been displaced. The plate was so constructed that it exercised pressure only on the bone and teeth which were displaced, and in an amount in proportion to the displacement—most upon the front of the broken bone and the first bicuspid, less upon the second bicuspid, and still less upon the first molar.

The accident occurred on the 17th of April; I first saw my patient on the 19th, and on the 23d the apparatus was applied. When the plate was first put on, it was very tight, and produced considerable pressure on the inner side of the fractured bone, causing, however, a sense of tension rather than pain. In a few hours this feeling passed off, and when, four days after, I next saw my patient, I found the position of the parts very much improved. This improvement was followed up, and still more advanced by altering the plate—making it wider, and by adding portions of gold within the crescentic excavations that received the teeth. From this date, the 27th April, my patient visited me about once a week, the plate having in that time ceased to produce any pressure, or exercise any influence requiring further alterations, till the 2d June, when, as I find from my notes, the maxillary arch was completely restored to its proper shape.

After this the plate was worn for many months—longer, I think, than was required, the patient getting used to it, liking it, and feeling it a comfort and support. I cannot, therefore, name the precise date when osseous union may be said to have taken place, but it has taken place, retaining the fractured bone in a proper position. I do not see what other method of treatment could have succeeded in this case. Probably, had no mechanical support been employed, the already existing obliquity of the teeth would have been increased by the pressure of mastication, and certainly could not have been diminished; but by the means adopted, stability of the detached bone was secured, and its position gradually and progressively improved, till it assumed almost, if not quite, its original place.

As it seems to me, important as this mode of treating a fracture of the *upper* jaw may occasionally become, the same principle, as applied to the *lower* jaw, is of still greater service. Any displacement that accompanies fracture of the superior maxilla is simply a passive condition : there are no muscles attached to the upper jaw which can derange or draw out of place the broken bone. With the lower jaw, however, the case is very different. The inferior maxilla is a floating bone, to which many powerful muscles are attached, and those connected with the rotating movement of the jaw—namely, the pterygoids—having a strong lateral antagonistic action. Destroy the integrity of the maxillary arch by fracture, and that antagonism ceases: the muscles on either side act independently, and draw the points to which they are attached more or less to the mesial line; and this it is which causes the overlapping of the fractured ends of the bone, often so obstinate, and necessarily with it the traction of the chin towards the side on which the fracture has occurred in the usual cases, where the lesion is in the horizontal ramus on one side. A plate or splint, and for the lower jaw I prefer an ivory one, carved to fit the interior of the arch of the particular jaw, with small crescentic excavations for the existing teeth, when placed in the mouth, restores the integrity of the arch for the time being. It may be worn without inconvenience long enough to allow osseous union of the fractured ends, preventing displacement the while.

Not long since I was consulted by a professional friend in such a case as this. The fracture had occurred in the horizontal ramus, about the situation of the first molar tooth, and this tooth, as well as the second pre-molar, had long since been extracted, and the usual method of treatment—that of tying together teeth in the neighborhood of the fracture—could not be resorted to. The displacement of the jaw, and the consequent distortion of the face, were extreme. The fracture had occurred on the right side; the left pterygoid muscles, being no longer resisted by the right, drew over the mass of the bone—the left horizontal ramus, chin, and anterior portion of the right horizontal ramus—towards the right side, and to such an extent that the left lower canine tooth corresponded in position to the interval between the superior central incisors. My friend and myself agreed that the best and most promising plan would be to re-connect the broken and now separate portions of bone by an ivory arch or splint, within the jaw, adapted to its precise form, and attached to the remaining teeth. This plan was adopted with the happiest results, the ivory splint being worn till union had taken place, with scarcely any perceptible malposition of the jaw.

*British Journal of Dental Science.*

[The American Journal of '52 describes an apparatus used by Dr. Krider for the purpose of setting fractures of superior maxilla. From its being capable of application in all cases by means of adjusting screws and its immovable character when so adjusted, it has proved more practical than any other ever offered for this purpose. It was invented by C. Reinhardt of this city, surgical instrument maker.—*Ed.*]

## ARTICLE XXI.

### *On the Arsenical Mineral Water of Whitbeck, Cumberland.*

By Arthur H. Church, F. C. S.

The recent reliable accounts of arsenic eating in Styria, the controversy as to the effect on the Thames water of arsenical perchloride of iron, and the detection of arsenic in numerous mineral waters and deposits invite special notice to the occurrence of this element. And now that the influence on the animal economy of arsenic in minute but repeated doses is attracting so much attention, I think that the following account, incomplete as it at present is, of an arsenical drinking water will prove interesting. My attention was first directed to the subject by the Rev. Mr. Wilkin of Booth, to whom, as well as to the Rev. Mr. Ormandy of Whitbeck and Dr. Fidler of Whitehaven, I am indebted for much information and assistance.

From the northern and western sides of Black Combe, a mountain in the southern part of Cumberland, situated near the sea, numerous streams or becks originate: I believe that only one of these exhibits any marked peculiarity. Whitbeck, such is the name of this stream, is fed by several small springs, and it was from the source of the most southerly of these where it rises from the ground, and at an elevation of about 900 feet from the sea, that I obtained a specimen of the water for examination.

On the 29th of June in the present year, the water, at the time of collection, had a temperature of 8° 5′ C. the air being 10° 6′. The reaction of the water as it issues from the earth was faintly but unmistakably alkaline: on testing the water after ebullition the effect was more decided. The water from many other sources in the neighborhood of Whitbeck, where decomposing granite is of common occurrence, has an alkaline reaction. A large and deep pool in the course of Whitbeck towards the sea shows the color of the water to be a rich clear greenish blue. The water, on examination, gave distinct indications of the presence of arsenic. This element, which here probably exists as an alkaline arsenite, occurs not as a mere trace, but in determinable quantity. I have not yet ascertained the amount present, but hope to do so shortly, when I have obtained specimens of the water collected at different seasons of the year. I have satisfied myself, however, that in some seasons of the year the quantity present approaches a good fraction of a grain of arsenic (metallic) in each gallon of water. At the same time I am desirous of furnishing complete analyses of some interesting minerals obtained from the vicinity of the spring. For on ascending the gulley, a few yards above the source of Whitbeck, we arrive at the entrance to a mine, which, some years ago, was worked for cobalt and copper, and is now again being searched. Here I obtained very rich and massive silver-white arsenical cobalt ore, and also copper pyrites. The neighborhood for some miles is in fact rich in minerals. Dr. Fidler writes: "Almost immediately behind Whitehaven Parsonage a sulphur vein crops out, a continuation of the same vein that is being worked at Under Hill, but whether it exists in any quantity I do not know. There are three or four copper veins in a ravine behind Whitehaven Mill, one of which has been tried some twelve or fifteen fathoms below the surface." Baryta, also, has been found, I am told, above the source of Whitbeck in the mine above mentioned. It will be seen that the arsenic in the water of Whitbeck is thus most probably derived from the veins of arsenical cobalt ore through which it percolates.

The arsenical water is *habitually used for every purpose* by the inhabitants of the little village of Whitbeck, and, as far as I can learn, with beneficial rather than injurious results. But it is remarkable that Whitbeck, though in every respect suitable for trout, is the only stream in the neighborhood from which that fish is absent; eels, however, have been found in it. Ducks will not live if confined to this arsenical water. When the railway was being carried past Whitbeck, the first use of the water quickly produced the usual marked effect on the throats both of the men and horses employed on the works. The soreness of mouth from which they at first suffered soon, however, disappeared, and in the horses gave place to that sleekness of coat assigned as one of the effects produced by the administration of arsenic. It is a question how far the rosy looks of the Whitbeck children and the old age which a large proportion of the inhabitants of the village attains are to be attributed to the arsenic present in the water they drink.—*Chemical News.*

## ARTICLE XXII.

### *Treatment of Delirium Tremens by large Doses of Digitalis.*

In the number of September 29th of the Medical Times and Gazette, Dr. G. M. Jones, Surgeon to the Jersey General Hospital, reports his treatment of Delirium Tremens by large doses of Digitalis. As the subject is of considerable interest, showing how large doses of this drug may be borne in certain conditions, we give Dr. Jones' views somewhat in full.

"About twelve years ago I was called to see a patient with delirium tremens, residing about a mile from my house, who was almost in articulo. I prescribed a dose of chloric ether with tincture of opium; but the wife, who came for the medicine, took, by mistake, a phial containing one ounce of digitalis. I discovered the error, and was horrified when I heard that the patient had taken this dose; but no less surprised than pleased when I also heard that, instead of being poisoned, he was very much better. Under ordinary treatment I fully believed he would have died; but after this singular dose he rapidly recovered. Profiting by this hint, I began to give digitalis in all cases of delirium tremens which came under my care in hospital and private practice, and during the last twelve years, I have adopted it in at least seventy cases—this effect of drunkenness being very common in Jersey.

"As to the dose, experience has taught me that the best dose is half an ounce of the tincture given in a little water. In some few cases, this one dose is enough, but generally a second dose is required four hours after the first. In some cases, but very seldom, a third dose is called for, but this hardly ever need exceed two drachms. The largest quantity I have ever given was half an ounce at first, half an ounce four hours afterward, and another half ounce six hours after that—making an ounce and a half in ten hours.

As to the effects of these doses, my impression is that the action is on the brain, not on the heart. The pulse so far from being lowered in force, becomes fuller and stronger and more regular, soon after the first dose. The cold clammy perspirations pass off, and the skin becomes warmer. As soon as the remedy produces its full effect, sleep for five or six, or seven hours commonly follows; sleep is the guide as to the repetition of the dose. No action on the kidneys is evidenced by any unusual secretion of the urine. Sometimes the bowels are slightly acted on, but not commonly. I have never once seen any alarming symptom follow the use of these large doses of digitalis. The only case I have lost since adopting this treatment, had a tumor in the brain. In three only was other treatment adopted after digitalis had failed to procure sleep; in other words, in sixty-seven out of seventy cases, digitalis was the only medicine used, and sixty-six of these patients recovered. I do not mean that these are the exact numbers of those treated; I am certain as to the death, but I may have had more recoveries. I am well within bounds in saying seventy cases in twelve years, and that all of them were well-marked cases of delirium tremens. Slight cases of nervous derangement after drinking I have seen in great numbers, but I speak here only of such cases as required active treatment. My previous experience of the results of the treatment by opium, or some of its preparations, by anti-spasmodics, etc., had certainly been much less successful; the proportion of deaths was much larger, and the recovery much less rapid. Again, I have treated more than one patient successfully by digitalis, who in subsequent attacks elsewhere, has been treated by opium and died; and in many of the cases in which I have used digitalis successfully, opium had been previously given without any good effect.

## ARTICLE XXIII.

### *Kreasote in Gangrene.*

Dr. Parke, an American physician who served in the Russian Hospital in the Crimean war, in speaking of the treatment of gangrene in sores and stumps, says:—

I cannot speak too highly of kreasote in this disease. I have seen gangrenous stumps looking perfectly healthy in forty eight hours, and sometimes in twenty-four, after the application of kreasote in the following manner. Where the gangrene had affected the stump to the extent of half an inch or less, I have taken the swab and applied the pure kreasote all over the diseased parts, and in the regular cavities, and then covered the parts with a cloth smeared over with liniment, composed of one drachm kreasote to Oj of oil. As I said, frequently in twenty-four hours, the whole gangrenous mass would come off on the removal of the dressing. The protruding bone was never cut off, but left until it became partially absorbed within the healthy granular mass, when it was taken hold of with forceps, twisted off, and extracted. The time necessary for its absorption generally amounted to several weeks after the stump had taken on a healthy action. In conclusion, let me say, our patients had a good diet, being served with plenty of soup, good fresh meat, rye and buckwheat bread (which they preferred) and occasionally good light wheat bread, *vodka* (rye whiskey) twice a day, and sometimes wine."—*American Journal of Medical Science.*

# REVIEW.

*Gutta Percha as a Permanent Stopping.*—Read before the O. S., London. By Henry Long Jacob, M. R. C. S.

We are in receipt of the above pamphlet, and accompanying it a small portion of the preparation. We regret that we cannot recognize any preparation as of a permanent character, in which gutta percha is the preservative agent. This preparation is remarkably white as well as remarkably light, showing a too great absence of the earthy portion, which is really the indestructible matter. Abundant experience establishes beyond question, the temporary character of any preparation of gutta percha for the mouth. We fear Mr. Jacob has not had the advantage of Dr. Hill's preparations of these materials as early as the profession in this country.

In 1852, Dr. Hill introduced his stopping five years previous to the reading of this paper, nor can we see any material difference in the two methods, except that we think the London process the longest and most tedious of the two. We are always pleased to acknowledge the advantages we have derived from various useful inventions, and are bound to acknowledge the credit in this case as entirely due to Dr. A. Hill, of Norwalk, Conn. B.

*The Anatomy of the Fifth Pair of Nerves and the Microscopical Anatomy of the Teeth.* Published by Jones & White, Philadelphia.

This is a well executed colored lithograph, principally descriptive of the fifth pair of nerves, and the microscopical structure of the teeth, but also representing some of the muscles and arteries, with a correct delineation of the surrounding parts.

It is perhaps quite as creditably executed, and as full as could be reasonably expected under the circumstances. The ultimate nerve fibre is always tubular, and should have been so represented in so fine a plate. Still the mere anatomy, as here illustrated, will aid the student and refresh the memory of the more advanced. We are, however, no advocates for studying this intricate subject through the medium of plates, as such are but doubtful and rude teachers. The description accompanying this plate is the briefest possible anatomical sketch, less full, and we may say, less desirable than Cruvelhiers, Sharpe and Quains or Wilson's. All the physiology of the nerve in its office in the animal economy as well as its pathology, are omitted; indeed, it is a bare anatomical description with the least possible reference to the vital relation of the nerve. This we think in so creditable a work is a fault, for the anatomy of any portion of the nervous system is less important than its relation to the normal phenomena of life, as also to pathological action. B.

*The Principles and Practice of Modern Surgery.* By Robert Druitt. Philadelphia: Blanchard & Lea, 1860, 8vo, pp. 695.

Druitt's Surgery has long been a favorite with students. The facts were so well arranged and condensed into so small compass, that while the descriptions of disease and operations lost nothing in the way of clearness, they were sufficiently brief to be soon studied and easily remembered. Probably there never was a text-book more completely free from redundant verbiage. This gave it an immediate and lasting popularity, until we venture to say it is more extensively used as a text-book than any other compendium of surgical art.

The present edition is revised from the eighth London edition, published about a year ago. We are happy to see that the author has kept his book up to the time. The recent operation of excision of the knee-joint is treated as fully as the plan of the work will admit, and the opthalmoscope is described with sufficient clearness to enable the student or the country practitioner to familiarize himself with the use of the instrument, after a very little practice. A very sensible chapter on anæsthetics is appended, in which, however, Morton is made a little too prominent, to the disadvantage of Drs. Wells and Jackson. The American editor, whose modesty conceals his name, has appended a very brief paragraph in reference to hypnotism.

The American publishers bring out the work in their usual creditable style. The wood cuts are numerous and very clear and neat. They are admirably selected for the purposes of illustration, and furnish an excellent exposition of the text.

# EDITORIAL DEPARTMENT.

**Dr. C. A. Harris**, the founder of this Journal and of the Baltimore Dental College, has gone to his rest—that rest prepared of old for such as he was. We find it next to impossible to speak of our loss. It is too recent, too overpowering, and of too direct personal concern to us for expression in words. Still, we cannot pass it by without some notice, however feeble and imperfect.

If we were to attempt to describe the character of our late most estimable friend, we should be able to comprise it in one word—"goodness." Amiability was his predominant trait, or something better than amiability, that christian charity which "thinketh no evil," which "suffereth long and is kind," which "is not easily provoked." It was impossible for any man to make an enemy of Dr. Harris. His generous heart forgave before a pardon was asked; plead against his judgment in behalf of those who had injured him, and was ingenious in finding excuses for all transgressions against him. He was one of those rare beings who "wrote his wrongs in water," who not only never cherished, but seemed incapable of feeling resentment. To his friends he was completely devoted; he never forgot them nor omitted any opportunity of rendering them a service. He was never satisfied unless he was expending his time, his money, or his influence in behalf of some one else. His whole life was one long act of benevolence. Pure as an altar-flame it rose, and has now lost itself in that heaven towards which it ever ascended.

It would speak ill, indeed, for human nature, were such a man to pass away without leaving many mourners. His loss is sincerely lamented by all who knew him, especially by those more immediately associated with him. We subjoin some of the testimonials which have reached us.

The Faculty of the Baltimore College of Dental Surgery, at a special meeting, convened on the 17th of October, passed the following resolutions:

*Resolved*, That the Faculty have received, with sincere sorrow, the intelligence of the decease of Prof. C. A. Harris, late President of this College.

*Resolved*, That as the projector of Collegiate Dental Education, and the laborious and successful founder of this College, Dr. Harris deserved the highest regards of the profession and the gratitude of the public. It may be said of him that he united Dental Surgery to Science, and raised the practice of it to the worth and respectability of a profession.

*Resolved*, That by the death of Prof. Harris this Faculty have lost a most valuable member—a man wise in counsel, pure in purpose and able in action.

*Resolved,* That by the death of Dr. Harris the several members of this Faculty have lost a highly esteemed friend—one of the most amiable and kind of human beings, warm and tenacious in friendship, almost incapable of anger, wholly incapable of resentment—an embodiment of the "charity that thinketh no evil," and of the humility that "esteemed others better than himself"—a man noble by nature and refined by grace—a gentleman by creation and a Christian without guile.

*Resolved,* That the Faculty will wear the usual badge of mourning during the College session.

*Resolved,* That a copy of these resolutions be sent to the family of Dr. Harris as an expression of sympathy in their great sorrow.

P. H. AUSTEN, *Dean of the Faculty.*

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The Dentists of New York and its vicinity held a meeting, the proceedings of which, in accordance with the request contained in the 8th Resolution, we copy.

Pursuant to call, a meeting of the dentists of New York and vicinity took place at the rooms of Messrs. Jones & White (which were kindly offered for the occasion,) on Monday evening, Oct. 8th, at 8 o'clock.

On motion of Dr. John Allen, Dr. Eleazar Parmly was called to the chair, and Dr. Solyman Brown appointed Secretary; when the Chairman proceeded to make the following remarks in reference to the sad occasion that had called them together:

"*Gentlemen of the Dental Profession:*—I am glad to see so large a number brought together on this occasion, and, permit me, first, to thank you for the honor you have done me, and for your friendly consideration in selecting me to preside at this meeting. There is, perhaps, no one present who has had the same opportunity of knowing the deceased that I have had. My long acquaintance with Dr. Harris, in the societies to which we belonged, and my more intimate connection with him in the Baltimore College of Dental Surgery, while I held the office of Provost in that institution, enable me to say, with truth, that I have never known a man of more generous impulses, or more genial feelings, than he whose death has awakened our sympathies, and brought so many of his professional brethren together to express their high respect for his professional character, their admiration of his attainments, and their exalted esteem for his moral, social, and personal worth.

As one to whom he was long known and endeared by the many virtues that adorned his character, I trust it will not be deemed unbecoming in me to give this testimony concerning one who has labored more arduously as a practitioner, more untiringly as a writer, and more devotedly as a teacher of the Principles and Practice of Dental Surgery, than any person who has in any way, or in any country, ever been connected with our professional art.

In his domestic relations, Dr. Harris was exceedingly happy. His home was one of the most hospitable and delightful that I have ever known.

His house and his heart were always open to all those who approached him with the remotest claim upon his benevolence and bounty, with a widely extended philanthropy.

On motion, the Chair appointed a Committee of three to draft a series of resolutions expressive of the feelings of this meeting on the present occasion. Drs. Ambler, Brown and Foster were appointed.

While the Committee were absent, the Chair suggested that the gentlemen present should all sign the original call for the meeting, and remarked that there were already more names appended to it than there were dentists in the United States when he first commenced practice, in 1815.

The Committee returned and reported a Preamble and Resolutions. On motion, the report was accepted by the meeting, and the Committee dismissed.

On motion, the meeting proceeded to take up the resolutions *seriatim*, and Nos. 1, 2, 3, and 4 were adopted without dissent. Considerable debate followed the reading of the fifth resolution, and various suggestions and amendments were offered by different gentlemen present. The resolution amended by Dr. Rich, so as to change the number of the Committee from twenty to three, was finally adopted by the meeting. The other resolutions were then read and adopted, when on motion, the report as amended was adopted as a whole, as follows:

*Preamble*, Every distinct profession in human society has its leading members, men of energy, talent and eminence. This is as true of the Dental profession as of any other, and not less true in America than in other quarters of the globe.

The names of Greenwood, Wooffendale, Gardette, Hayden, Flagg, Hudson, Koecker, and Randall, among others that have left their sublunary labors, are evidences of this fact.

It has become our melancholy duty, in pursuance of the objects of this meeting, to add another name to this catalogue, more highly distinguished than any of his predecessors, for numerous and valuable contributions to the science and literature of his profession, as well by his writings as by personal inculcations as a teacher at the head of the oldest, and, for a long period, the only Dental College in the world.

Chapin A. Harris has gone to his rest. On Saturday, the 29th of the last month, he fell asleep, to awake in an endless Sabbath. His family, his profession, and his country are left to mourn his loss. We, therefore, offer to this meeting, composed of some of his professional brethren, the following:

*Resolved*, *First*, That, in the death of Dr. C. A. Harris,, removed from his earthly labors in the prime of manhood; from his family in the fervor of affection; and from his country in the ardor of his usefulness; we recognize a sad bereavement, which the members of the Dental profession in all civilized lands have just occasion to deplore.

*Resolved*, *Second*, That the labors of Dr. Harris, in assisting to establish the American Journal of Dental Science, the American Society of Dental Surgeons, and the Baltimore College of Dental Surgery; as well as in the construction and publication of his Dictionary of Medicine and Dentistry, and his Principles and Practice of Dental Surgery, have conferred favors on his profession which gratitude can never repay, because these and other labors in the same direction, have broken his health, abridged his life, and gathered his friends and his family around his early grave.

*Resolved, Third,* That a committee of three be appointed by this meeting to convey to the family of the departed, the sympathy of its members, on occasion of their great and irreparable loss.

*Resolved, Fourth,* That, in view of the great and important services which the self-denying labors of Dr. Harris, have rendered to the Dental profession, a suitable testimonial be presented to the family of the deceased, by such members of the profession as may choose to contribute to that object.

*Resolved, Fifth,* That a Committee of three be appointed by this meeting to invite all dentists to unite with us in subscribing to raise a money testimonial, to be presented to the widow of the late Dr. Harris, and that this Committee have power to appoint sub-Committees in Europe and America to carry out the above object.

*Resolved, Sixth,* That the said Committee be instructed to give ample notice of the purpose above explained, not only in all the Dental Journals, but also by means of a printed circular forwarded by mail to all the dentists in the United States, appointing the time for the presentation of said testimonial to the family, and determining the manner in which the fund shall be appropriated to its object.

*Resolved, Seventh,* That the Committee hereby authorized to receive and appropriate the contributions made for the benefit of the "HARRIS TESTIMONIAL FUND," shall be instructed to use no part of said fund for any expenses except for printing and mailing the circulars and letters sent to members of the profession, editors of periodicals, and members of the Harris family.

*Resolved, Eighth,* That this meeting hereby requests all editors of Dental periodicals to publish the proceedings of this meeting, together with the circular issued by the Committee, free of charge.

SOLYMAN BROWN,
JOHN G. AMBLER,
J. H. FOSTER,
*Committee on Resolutions.*

On motion, the Committee of three mentioned in the fifth resolution, was appointed, consisting of Drs. Eleazar Parmly, Solyman Brown and E. J. Dunning. On motion, a Committee was appointed to transmit the resolutions adopted by this meeting to the family of the deceased, Dr. Harris. The officers of the meeting, assisted by Dr. Foster, were appointed a Committee. A resolution of thanks was then voted to the officers of the meeting, and briefly responded to by the Chair, after which the meeting adjourned.

During the proceedings, Drs. Parmly, Rich, Allen, Hill, Gunning, Roberts, Clarke, Castle, Franklin, Burrows, and others, took occasion to express their sympathies with the occasion which had called them together, and their deep appreciation of the worth of the late Dr. Harris and his labors. The meeting was well attended, some fifty of the most prominent members of the profession in New York being present."

A full and complete biography of the late Dr. C. A. Harris, is in course of preparation, and will appear in a future number.

*A New Disease of the Gums.*—M. Marchal has lately given an account, before the Academy of Sciences, Paris, of an undescribed disease of the gums. It first loosens the teeth, and, subsequently, causes them to fall out. Hence the disease has been characterized as *expulsive inflammation of the gums.* It is generally suppurative, and sometimes ulcerous. The remedy is a local application of iodine.

We shall furnish a translation of M. Marchal's memoir in the January number.

*Hypnotism.*—Our English exchanges and some French journals are being troubled about hypnotism. It is nothing more than a new form of mesmerism, only more of a shadow. That fixity of vision may produce many mental phenomena, we doubt not, but that it can overcome the greatest law of the animal economy, the most powerful instinct, we think most unreasonable.

It is useless to attempt to foist upon the intelligent of this day any nonsense, especially unsupported by a rational hypothesis. This hypnotism is a naked foundling, which the proper authorities will no doubt trace to the parentage of clairvoyance. B.

*Adulterations.*—We are but slowly correcting the destroying arts of tradesmen in their various adulterations. Some of the states, as Ohio and New York, have made laws and appointed Chemists for the examination of liquors, leading to many fearful discoveries in the nature of slow poisoning of all whiskey and brandy drinkers, but it must be extended to include all articles of consumption. For instance, last year, Europe and America consumed 330,000 tons of coffee, whilst the whole production of the world was 312,000 tons. The present year's estimates are made of consumption 337,000, whilst possible produce is only 274,000 tons. Sugars are well known to be freely mingled with dirt, principally sand, and most of our valuable medicines are so closely imitated and adulterated, as to lose at times their desired efficiency. Quinine and creasote are generally found more or less impure from their adulterations, with a host of others useless to mention. The profession could aid any wholesome reformations from the immense influence they could command by well directed efforts, and this the common enemy of man, should be opposed from every quarter. B.

*Painless Reduction of Dislocation,* is said to have been accomplished through the application of compresses saturated with chloroform. B.

*Orum & Armstrong's Teeth.*—We received, some time since, a small card of the above manufacturers' teeth. A notice of them should have appeared in last number, but the unfortunate illness of the senior editor prevented.

These specimens are made to imitate the polished surfaces of the English manufacture, to a certain extent, and we judge there has been quite an improvement in this particular, as the polish has not been carried so high as to destroy the appearance of natural structure, so that these teeth present a much closer resemblance to the natural organs. The foreign make, as generally required to match natural teeth, is, we have found, peculiarly deficient in this particular, giving, in most cases, the unmistakable evidences of artificial origin.

The present sample is a decided improvement in these particulars, with a carefully regulated amount of polish, the gum alone being still a little too glassy. The size and form of the crowns are beautifully varied within *practical* limits, for, however correctly formed a tooth may be, it is entirely useless if too large or too small. The sizes before us are extremely well managed, and are those generally required. The lateral joints are quite as accurate as is generally found; but there is room for improvement in this particular in all artificial teeth with gums, or else conundrum wheels must be made of better crystal than we have had the good fortune to procure.

We have never seen better single gum plate teeth than those now made by Messrs. Orum & Armstrong. The practice of the present day demands blocks of teeth in sections of various arches, as suitable for plastic work, and we trust these manufacturers have as successfully supplied this want, as they certainly have with the single plate. B.

*Homeopathic College.*—New York has distinguished itself by instituting an incorporated Homeopathic College, and we are a little surprised to see some very respectable names as corporators. Its faculty are men unknown outside of the city, or to science,—boasting the title of M. D., which, if worth anything, would utterly refute all scientific claims by their Hannemhannic theory. According to close observation, it is gradually wearing out the world over. Its only well known advocate, Henderson, is, by grace, in a respectable position professionally; but by justice, a dead man in the scientific world. B.

*Professional Appointments.*—Dr. E. Warren, of N. C., formerly editor of the N. C. Journal of Medicine, has received the appointment to the Chair of Materia Medica in the University of Maryland, vacated by the death of Dr. C. Frick. Dr. W. A. Hammond, U. S. A., has been appointed to the Chair of Anatomy and Physiology in the same school to fill the resignation of Prof. Roby. B.

*The Medical Convention.*—In June last, the American Medical Association passed a resolution recommending medical schools to reject all students not possessing a classical education. Not wishing to enter upon the merits of the matter, we would have preferred a resolution recommending the schools to be more exacting in their requirements from candidates for the M. D. What is wanted is, that this suffix to a name, should stand as an incontestable fact, that at the time of its acquisition, the candidate at least was qualified to aid man in his struggle for life. The best preliminary education will not fit all men to become doctors. This can only be known when he places himself before an examining body, who themselves being qualified to judge, make just, exact, and conscientious requirements of indubitable proof. This would remedy, to a great extent, the evil such a resolution is intended to arrest. High merit, alone, should carry a candidate through a trial which should be deep and earnest, looking to the cause of humanity, which often rests so completely under the charge of the physician. Abolish competition in schools and sympathy in men, and our present system is wise enough. B.

*A Novel Needle for Sutures*, has been invented by Prof. P. F. Eve, to carry wire or silk, principally the former. It is a hollow needle, with an aperture just before its point, upon the inner curved surface, for the egress of the wire after the edges of the wound have been punctured by the needle. It is mounted upon a handle, the lower end, or eye, has the opening for the wire upon its under surface, so that the needle is thrust through the parts. The wire being straight, with its point within the needle, is now pushed a short distance through, and the needle withdrawn, leaving the wire in its place. It is now cut off, so as to leave an end protruding from either edge, and twisted or bent, as the case may require, care being had to prevent the sharp ends from wounding the surrounding parts. Platina wire would prove better than the silver, which is commonly used, from its being softer and less resisting.

It is a simple and ingenious improvement in the ordinary needle—very useful in staphyloraphy and other operations of the dentist. B.

*Electricity as an Anæsthetic.*—A part of a very large work upon Electro Therapeutics has been devoted to the above theme, in which the author concludes it is of comparatively little value, generally producing one pain instead of another; that if the electric current is strong enough, the patient cannot bear the pain it produces, if not strong enough, then it is useless, and in fact it is worse than useless in any way it can be used, as a local anæsthetic. The current is so rapidly conveyed through the body, that it can only act instantaneously as a local application, and is consequently ineffectual to a part. B.

*Chloroform Liniment for Dental Purposes.*—Take the white of an egg and add an equal bulk of chloroform, let it digest four hours at an ordinary temperature, when it is fit for use. Apply to the gum, immediately above the aching tooth, by saturating a piece of lint, one-half inch in length by one-fourth in width, upon this place a second piece of dry lint larger than the first, to protect the lips, which must be allowed to carefully fall upon the two, so as they may retain their place. We have found this an invaluable relief for such disturbances as are not dependent upon fully developed inflammation, such as neuralgic disturbances and the first stages of periostitis.

A more powerful liniment can be made by taking one part of white of egg and four parts of chloroform, put them in a bottle and plunge it completely in a water bath at the temperature of from 120° to 140° Fahrenheit. Gelatinization takes place in four minutes.

This preparation is to be rubbed on any painful part, when great relief will be experienced. The slow cauterization it produces, and the protection of the part from the atmosphere, render it a very powerful counter-irritant, as applied to the gums in the manner described; we have found it in many cases highly serviceable and recommend it to more general use.

The cold preparation is perhaps the best and easiest made, and when a decided effort is required, it should be repeatedly used. B.

*Psychology.*—Mr. Moreaw has written a work upon Morbid Psychology, in which is proposed the erroneous doctrine, that great geniuses and monomaniacs, alike owe their peculiar condition to a diseased state of the nervous centers. He says: "Genius is owing to an unusual activity of the nervous centers; insanity is also owing to an unusual activity of these centers," his corollary being that they are similar *morbid* conditions. He could as well reason that the function of any organ and its diseases were alike, both depending upon a certain activity. The difficulty is his want of discrimination between a normal and an abnormal activity, a difference as palpable to the scientific man, as is a clear or muddy stream to the ploughboy. B.

*Ceratitis.*—In reports from St. Bartholomew Hospital, it appears that in congenital syphilitic ceratitis remarkable peculiarities are invariably found in the prominent teeth. The incisors become narrower from the gums to their cutting edges, with very much rounded corners, almost pointed, except that through the point a notch is found extending to the gum on the frontal surface, as a shallow groove. This is strongly marked in the lower incisors. In such a condition the teeth decay near the gums, and soon are lost from caries out of the mouth. B.

*Scrofula.*—Dr. Gregory, of Edinburgh, asserts as his belief that there is not a family in Great Britain in which scrofula does not exist. B.

*Bad Breath.*—The following recipe is taken from an exchange: Chlorate of potash, two ounces; sweetened water four ounces; a teaspoonful to be taken a few hours after breakfast, and the mouth washed occasionally with it. This trouble principally arises from a diseased condition of the gums, often produced by secretion of calculi around the necks of the teeth; when dependent upon this cause, all correcting agents will be but temporary. The only cure is the removal of all accumulations, and restoring the gums to health by frequent friction, as from a brush with astringent washes containing subborate of soda. B.

*Sir Benj. Brodie* is still suffering from impaired sight. The operation performed upon him of iridectomy has not been successful. The hope is, that it may prove a cataract which can be extracted. The loss to science of this able man would prove a world-wide calamity. B.

*Dr. Baillie* affirms that women are less subject to disease of the arterial system than men, owing to their more sedentary life, producing less impetus in the circulation, and less liability to diseased alterations of structure. B.

*Platinum.*—It is a proof of great advancement in the department of metallurgy that this metal is now cast in iron ingot moulds, by the process of St. Claire Deville and Debray. The process is described in our present number. B.

*A New Trephine* has been invented by Dr. Galt, of Va. It differs from the old trephine in being conical and having the crown teeth oblique, the teeth divided by grooves extending up the outside of the cone, so as to form cutting ribs something after the fashion of a screw. It proposes to cut only through the cranial plates, when from its cone-shaped ribs, it ceases to cut by becoming wedged. B.

*Pivot Teeth,* when skillfully done, prove to be the most satisfactory of all artificial teeth worn during a period ranging from eight to fifteen years. The fang unnoccupied by the pivot should be filled with gold, the wooden pivot should accurately fit the aperture made for it in the fang, and the artificial crown accurately fitted upon the face of the fang. B.

*Dental Society.*—A new society was formed under the name of the Kentucky State Dental Association, W. D. Stone, President. Some few subjects were discussed; members appointed to read essays, and adjourned to reassemble in Louisville the second Tuesday of April, 1861. B.

*Fang Filling.*—Prof. Watt reports several cases in which the nerves of the teeth had been extirpated, and the crowns filled after his peculiar method. He claims satisfactory success. Every practitioner was compelled to allow the dead pulp to remain in a tooth before fang filling was introduced, and success frequently attended his operations. It was found, however, from many failures, injudicious practice, and the nerve was extirpated and its place partially occupied with substances used in filling; creasote being used to purify and to produce cicatrization. Greater success attending this, it was carried into a systematic operation, and when well done, is most generally highly successful. Professor Watt recommends filling the crown only with gold, after treating the pulp cavity and fang with creasote. B.

*Plaster Impressions.*—A writer in the Register for June advocates plaster for impressions in all available cases, as giving superior results, more cleanly and accurate, which we fully endorse. It is often too lightly held in contact with the parts to be taken, and managed with too much impatience, but, properly used, it is infinitely superior to all other materials for this purpose. B.

*The Mallet.*—We have been a little surprised to see this instrument recommended in the operation of filling teeth. Nothing can be more unnecessary and unsafe than its use in many of the delicate operations of the mouth. It must be awkward, unseemly, and calculated to alarm many patients, besides, being incapable of securing any real benefit over a masterly use of proper instruments. The epithet of "tooth carpenters" will be less inapplicable, if such singular implements become common in dental offices. B.

*An Indian Medical Journal* has been established in Oordoo, E. I., entitled the *Akbare Tubabut.* It is intended as a medium of communication between native doctors in government employ and native Hakims, for the improvement of medical and surgical knowledge, and the greater alleviation of the many diseases to which the millions of inhabitants of this country are subject. B.

*Revoking a Diploma.*—The N. Y. Medical College has revoked the diploma given by them to a John F. Dunker, of Newark, assigning as a reason that he obtained it under gross deceptions, and that he was a notorious quack. B.

BALTIMORE, *October* 24, 1860.

*To Dr. A. A. Blandy:*

"Consequent upon the death of our highly esteemed and much lamented colleague, the late Professor Chapin A. Harris, the title of the Chair thus made vacant was "Principles of Dental Science and Practice of Dental Surgery."

The "Principles of Dental Science" have been transferred to the "Chair of Professor," Philip H. Austen and Ferdinand J. S. Gorgas, A. M.. D. D. S., has been elected Professor of the "Practice of Dental Surgery."

P. H. AUSTEN, *Dean.*

*Dentists and the R. C. of S.*—One hundred dentists have taken the License from the R. C. of S. of England, evidencing great want of co-operation in their dental school system.

When a faculty ceases to conduct a dental college upon a proper basis, the profession are justified in refusing to support them, but not otherwise. Money making should be lost sight of, and he who cannot, or will not, give his arduous labor without compensation, is not fit for so honorable a post.

A second, or any added occupation to that of the dentist, most properly disqualifies him for membership of any of the established Dental Societies of England. B.

*Death from Inoculation of Virous from a Cancer.*—D. Lemarchand died in consequence of a puncture with a suture needle, which had laid some time in a wound made by the removal of a cancerous tumor. B.

*The Power of Courts Over Medical Witnesses*, has been recently determined by *Judge Marsh*, of Ohio, to the effect "that a medical witness could not be compelled to disclose facts confided to him in his professional capacity."

This is a very important step, if other and higher courts sustain the opinion. B.

*Cholera.*—An exchange states that this disease is traveling through Spain, and is now in Gibraltar. B.

*Delay of the Present Number.*—We must ask the indulgence of our readers for the delay of the present number. The melancholy cause is already known to them. For all the purely dental articles, and for much of the other matter, they are indebted to the kindness of Dr. A. A. Blandy, who has given no little time and attention to it.

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